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OCTOBER 1993 • ISSUE NO. 64
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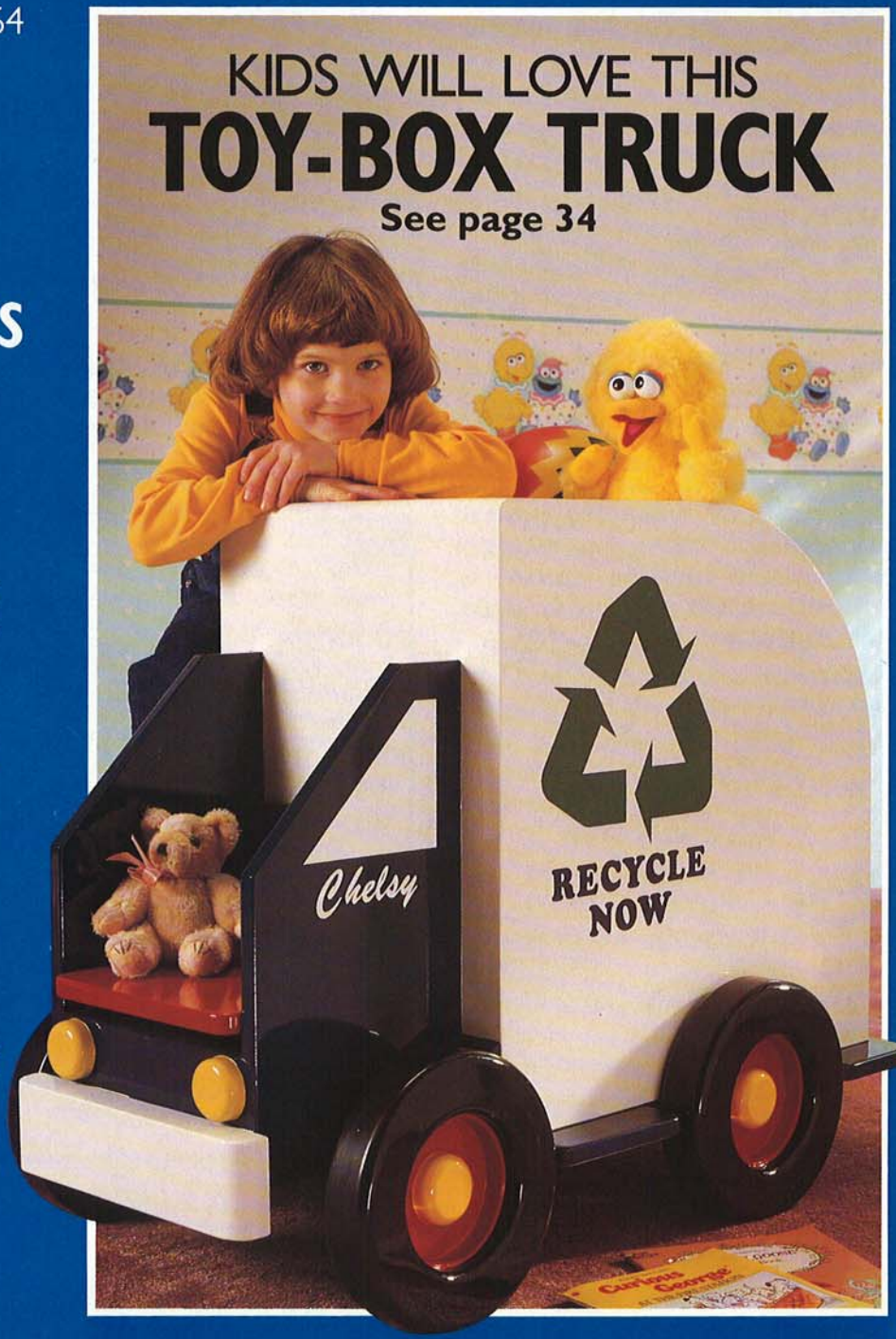

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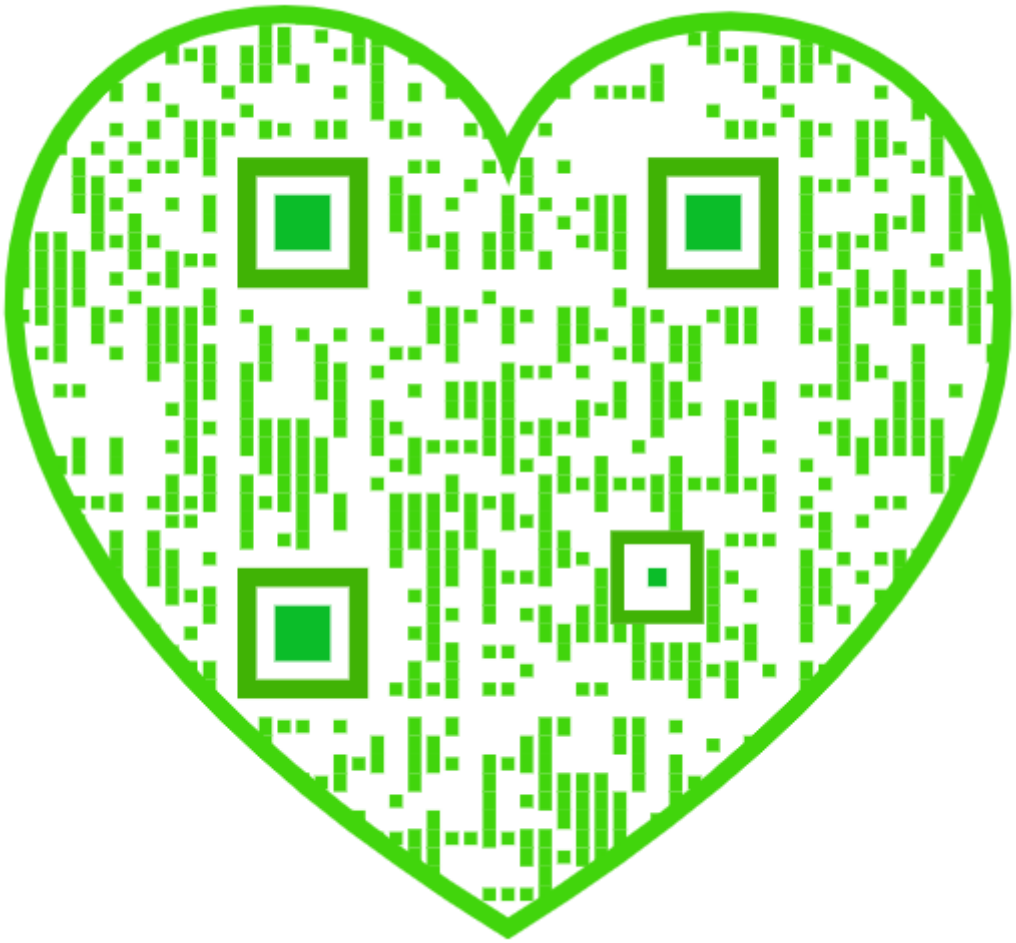

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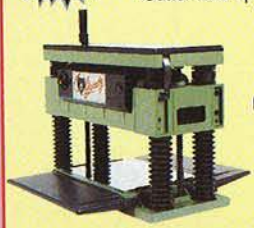

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THE EDITOR'S ANGLE

WOOD® Magazine's BUILD-A-TOY® CONTEST GOES COUNTRY

▲ Auction hostess Louise Mandrell poses for a photo with Publisher Bill Reed and me.

▼ Before the bidding began, people had a chance to see and inspect the gathering of toys up close.

Many may recall that in December of 1990 some of the winning entries from our Build-A-Toy contest were displayed at the American Museum of Folk Art in New York City. Then in 1991 we moved the event to Los Angeles and had our first toy auction.

But the most successful event to date was in 1992 when we exhibited your award-winning toys during the National Crafts Festival at Silver Dollar City in Branson, Missouri. Well over 300,000 people had the opportunity to view and appreciate your good work.

Then, in December, we and Silver Dollar City sponsored a benefit auction at the 4,000-seat Grand Palace Theater in Branson. Singer Louise Mandrell hosted the auction, singer/auctioneer extraordinaire LeRoy Van Dyke auctioned off the first few toys, and by afternoon's end, the cashiers had taken in over $20,000 for the Marine Corps Reserve's Toys-for-Tots program. All of you who took time to build toys for our Build-A-Toy competition can feel the satisfaction of having made many underprivileged kids very happy this past Christmas season.

Events such as those referred to above allow *WOOD* magazine to promote woodworking as a true art form, to reflect the excellent craftsmanship of you, our readers, and demonstrate the generosity of both *WOOD* readers and advertisers. And with your continued support, we'll be able to make a difference in the years to come. A big thanks from all of us.

Join in the fun and giving

You say you just can't wait to get into your shop and start on your toy for the next contest? Then turn to *page 82* and check out all the details. Together, we can make this year's Build-A-Toy competition better than ever.

Larry Clayton

Photographs: Colleen Reed

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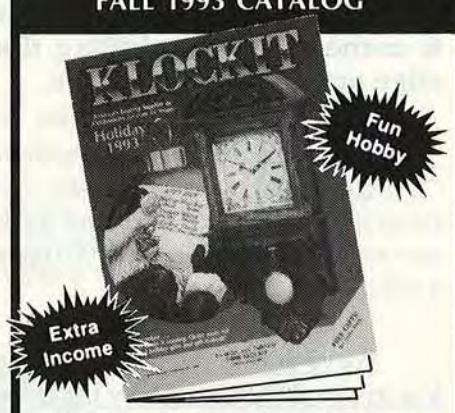

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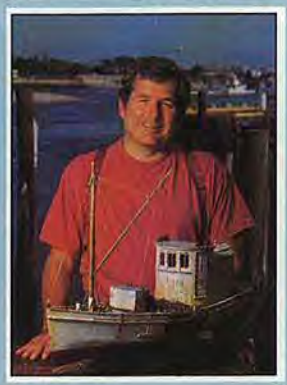
This issue's cover wood grain is basswood *Cover photograph: Wm. Hopkins Photography*

OCTOBER 1993 ISSUE NO.64

WOOD PROFILE

White ash: good wood for good sport 27

Baseball bats, tennis racquets, hockey sticks, tool handles–these are only a few of the many uses of this versatile wood.



CRAFTSMAN CLOSEUP

Where realism rides the waves 29

Capturing the waterman's way of life along the East Coast describes Steve Rogers' devotion to modelbuilding. His authentic, scaled-down, wooden workboats tell gobs about the glory days of this area's fishing industry.

Keep-on-trucking toy box 34

Build this sturdy recycling vehicle, and watch your kids work hard to fill it with the toys and stuffed animals strewn on the the playroom floor.

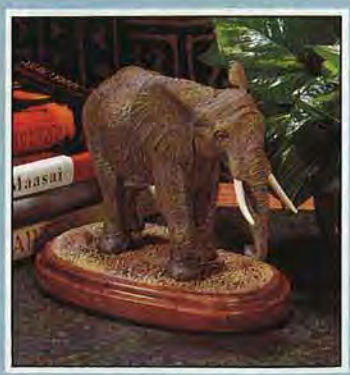
Projects with porpoise 39

Dress up your desktop at home with this fine trio of accessories that includes a lidded box, a pencil box, and a letter holder.

TOOL BUYMANSHIP

Lathes under $600 42

Is buying a new lathe too big an investment right now? You just might reconsider after scoping out these 10 hardworking models, all under $600!



CARVING

Perfect pachyderm 48

Experience power-carving at its finest by detailing this realistic replica of Nature's largest land animal. See our special bit selection inside.

SHOP-TESTED TECHNIQUE
Turning between centers 52
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TURNING PROJECT
Sweet-tooth skewers 58
Sweeten your woodturning diet with our designs for easy caramel-apple handels. Instructions include a Better Homes and Gardens® recipe.

Comfort-plus Shaker bed 60
Bring style to your sleeping quarters with this striking queen-sized bed. Later, build our matching tall chest and cheval mirror.

Five years and still a super contest 66
Check out the craftsmanship and creativity of the winning entries in our 1993 toy contest.

What woodworkers need to know about screws 68
Study up on today's threaded fasteners and see what ones serve your needs best. You'll learn a few driving tips along the way.

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Accent an empty wall with the colorful shapes of fall.

Gentle giant of the woods 72
You don't need carving credentials to form this sleek, shelftop moose.

Here's the scoop on food-safe finishes 74
Discover the healthy approach for treating kitchen woodenware.

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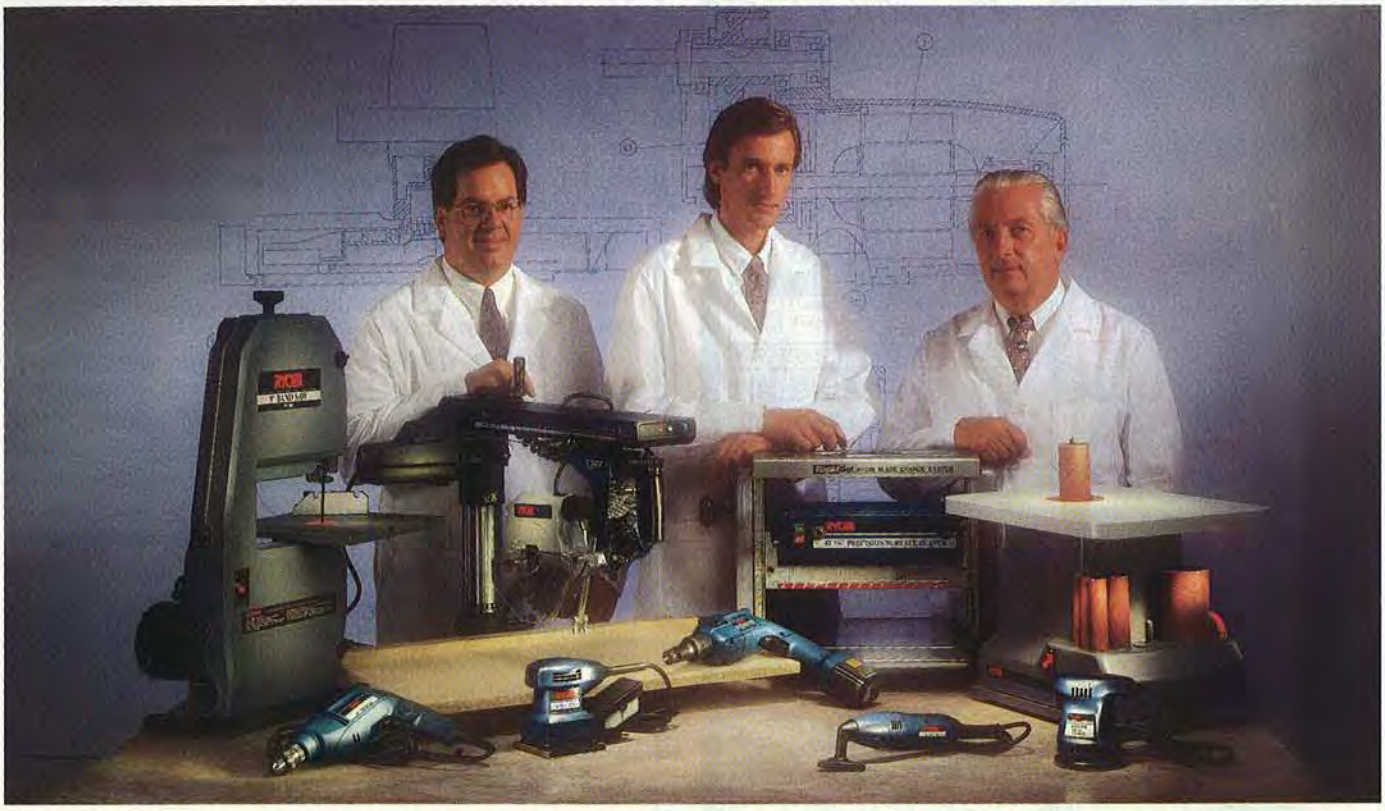
MPA

While other geniuses have been out collecting their Nobel Prizes, ours have been experimenting in the basement again.

They look harmless enough. But send these men to the basement at Ryobi R&D, and they go wild. This year, it all started with the new OSS450 Oscillating Spindle Sander – the first in its price range to combine up-and-down and rotary motion for burn-free finishes on



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TALKING BACK

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, Better Homes and Gardens *WOOD* magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

How to size name on V.I.P. plaque

Your V.I.P. door plaque on *page 70* of issue 60 was great. I've made three so far. However, the letters that we're supposed to use as templates, beginning at the bottom of *page 40*, are not the same size as those in your plaque. Your plaque's "name" letters are 1⅛" tall while the pattern letters are ⅞". What should we do about this discrepancy?

—Walter Childs, Memphis

Find a copy machine and enlarge the patterns to 117%, Walter. This will give you the 1⅛" size we actually used in our plaque. However, one note: If you are making a name with over seven letters, you might want to consider using the smaller, printed version, or even reduce them further in the case of a truly long name.

Hand protection while cutting glass

In your article on how to make leaded-glass panels in issue No. 61, you do not mention any hand protection. While working for a glass company, I learned that a glass sliver in the body is virtually undetectable. I urge anyone working with glass to protect their hands.

—Mike Greenlee, Cochranton, Pa.

Mike, for another opinion we contacted several stained-glass professionals in our area. While they do not wear gloves while cutting glass, they do recommend other safety procedures.

First, they suggest keeping all work areas free of glass slivers. Use a bench brush and dust pan to clean slivers and glass scraps from the work surface after each series of cuts. This preventive measure also reduces the chance of a sliver scratching the next piece of expensive glass you cut.

Glass cutting is actually a controlled breakage, and occasional splinters may fly off. Our pros urge you to wear eye protection at all times.

For safety and effectiveness, our pros also strongly advise using running pliers to separate strips of glass. Such pieces could shatter in your hands.

Working with glass should be a safe and enjoyable craft, so long as you take your time and stay focused on the task at hand. If you should cut your skin, be sure to wrap it adequately so that lead cannot enter the wound.

Indiana oak grove keeps USS Constitution shipshape

In reading the April 1993 issue, *page 33,* I found the article concerning the uses of white oak very interesting. The part about how this wood was used in the construction of the USS Constitution struck close to home.

You'll be happy to know that the U.S. Navy still maintains this fine ship with white oak from the hills of southern Indiana. I hope you can come out and visit our "Constitution Grove" someday. We'd love to have you.

—Nyle Riegle, Naval Surface Warfare Center, Crane, Ind.

What's wrong with radial arms?

In response to Jim Boelling's stand on radial arm saws in issue 60, *page 30,* he should realize a hobbyworker makes good use of the tools he has available. It might be wise for *WOOD* magazine to take another look. For some hobby and project workers, the radial arm saw is their primary saw.

—Bob Summers, Evansville, Ind.

We never wanted to leave the impression that people shouldn't use radial arm saws. We do prefer the mitersaw, and were simply stating those reasons.

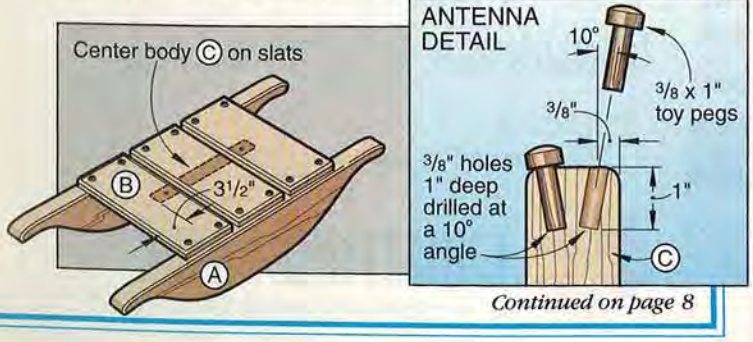
Adjustments to a snail

Smiley the rocking snail in the June 1993 issue looks like a real fun project to make and for youngsters to play on. But maybe we should sacrifice a bit of realism for safety's sake. A sudden stop or movement could cause the rider's head or eyes to collide with the antennae.

Eugene E. MacMahan, Fern Park, Fla.

Eugene, we've received several letters from readers pointing out this problem with Smiley, and we have changed the design to protect our very precious riders. We recommend that the antennae pegs be shortened to 1" in length, and the mounting holes drilled 1" deep. After you install the pegs, the antennae will be small round knobs.

Other alert readers noticed another error in the snail plans, involving the placement of the snail's body on the slats. The measurement from the front edge of the slats to the front of the body should be 3½".



Continued on page 8

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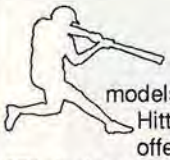

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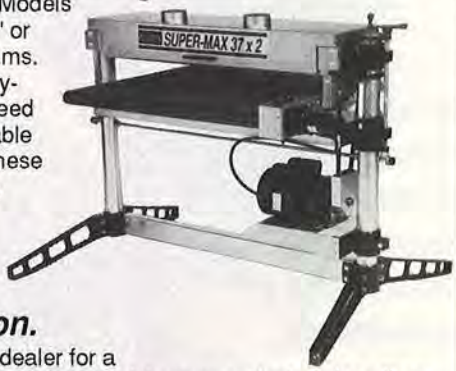

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TALKING BACK

Continued from page 7

No sawdust in "dream shop?"

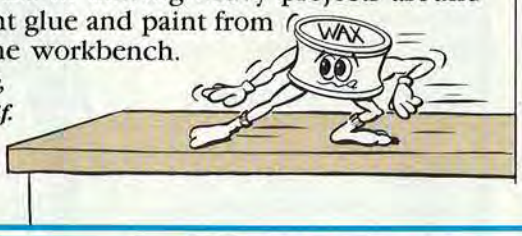
In your "Home Workshops That Work" (issue 60, *page 65*), I couldn't help but chuckle a bit when I read that Gil Wilmer regularly waxes and buffs all tabletops. It really does look like a "dream shop," but I can't see any sawdust. No disrespect intended, but does this shop really see work? My shop is in a 9x6′ corner of my basement, and I'm lucky if I can find my workpiece. Still, it provides me with countless hours of pleasure, as does your magazine.

—Dennis Nelson, N. Olmstead, Obio.

And now, the rest of the story . . .

Thank you for the nice write up and the pictures of my shop in your April 1993 issue. I noticed the article says I regularly wax and buff all table tops. I realize I may be a little compulsive but I really don't do them regularly. Actually, the reason I wax them is for ease in moving heavy projects around and to prevent glue and paint from sticking to the workbench.

—Gilert Wilmer, Fair Oaks, Calif.



Copper nails still available

I have begun making the "What-Not Basket" shown on *page 78* of your October, 1989 issue. But I have been unable to find the copper nails. I tried to order from Faering Design, the company listed in your buying guide, but they seem to no longer exist. Can you help me find the nails?

—Robert Bradley, Scotia, N.Y.

Faering Design still exists, Bob, but they don't take phone orders. They just moved to a new location. Write to them at RD 2, Box 950, Putney, VT 05346.

Wants a Dubby cutoff fixture

I would like to receive information on the Dubby cutoff fixture shown in your "Tips" section of issue 59, *page 10.*

—Gerald Myers, Wellsville, Pa.

Gerald, you can call In-Line Industries at 800/533-6709, or write them at 661 Main St., Webster, MA 01570. The fixture sells for $135.95 ppd.

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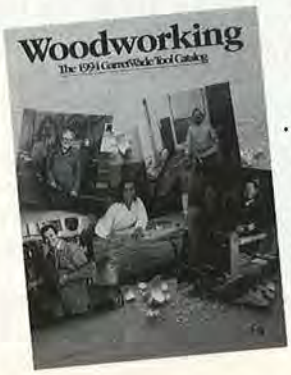

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TOP SHOP TIP

For his tip, Jeff receives a Black and Decker Sawforce 400 portable circular saw, shown *right.*

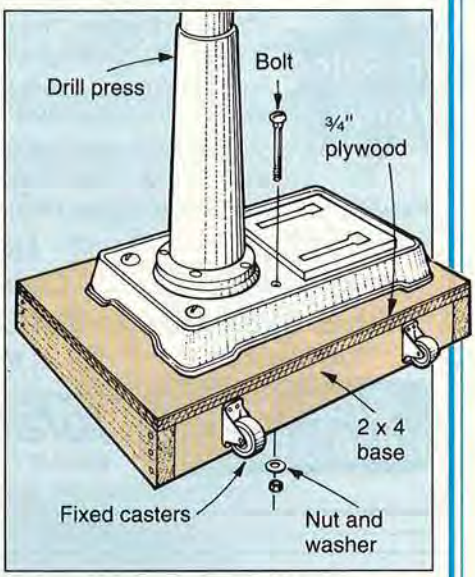
Drill press gets around on an easy-to-build base

In most instances, casters work great for moving tools. A floor-standing drill press, with its high center of gravity and small base, is an exception. How can you move one of these heavyweights, short of grabbing it in a bear hug?

TIP: Construct a simple base like the one shown *right* from pieces of 2×4 and ¾" plywood. Install a pair of 2" rigid-plate casters (nonswiveling) on the left side. With the base flat on the floor, locate the casters so the wheels clear the floor by about ⅛". Bolt the drill press to the base.

To move the drill press, stand facing the left side of the machine and tip it slowly toward you like a two-wheel dolly. Support the drill press securely by holding onto the table or head, as convenient. Tilt it just far enough for the wheels to contact the floor, and roll it away.

–Jeff Masterson, Monterey, Calif.



Paint bottles promote better biscuit gluing

Gently, you squeeze the bottle of woodworker's glue, aiming to inject a bit of adhesive into a biscuit slot. Just a little more, now, and . . . splurt! As you wipe up the glue dripping from the project part onto your benchtop, you notice there still isn't as much glue as you wanted in the biscuit slot. What's a woodworker to do?

TIP: With soap and water, wash out an empty 2-oz. plastic bottle for acrylic paint, the kind tole painters use. Pour some glue into the container and screw on the top. The small opening, about ⅛" or so, lets you squeeze out small amounts of glue precisely where you want them, even into slots for small no. 0 biscuits. The bottle's flip-top lid seals tightly.

–Sheila Heckman, Shartlesville, Pa.

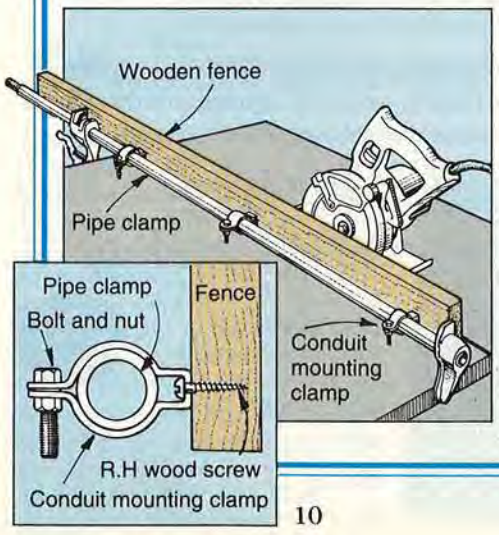
Pipe clamp proves a boon to straight-line sawing

A portable circular saw often turns out to be the handiest tool you have for crosscutting large sheets of plywood. Without a guide, however, you'll have a tough time making a straight cut.

TIP: With a pipe clamp, a straight piece of 1×4 stock, and a few pieces of hardware, construct an adjustable fence for your circular saw. (It works great with a router, too.) Choose a pipe clamp that spans the sheet you're cutting, and then cut the 1×4 fence to that width. Attach the fence to the clamp with standoff conduit clamps, shown *left*, which prevent interference between the fence and the clamp. Close each conduit clamp with a bolt long enough to act as a leg to keep the fence from tipping. Cover the end of the bolt with tape or foam to prevent scratching the material.

–George Williams, Elk Grove, Calif.

Continued on page 12



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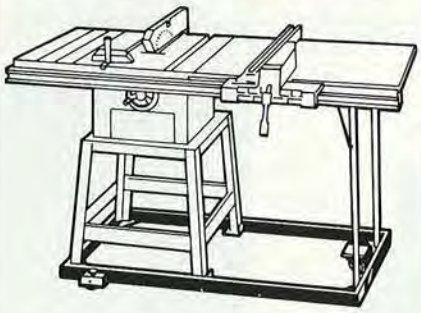

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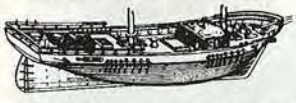

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TIPS FROM YOUR SHOP (AND OURS)

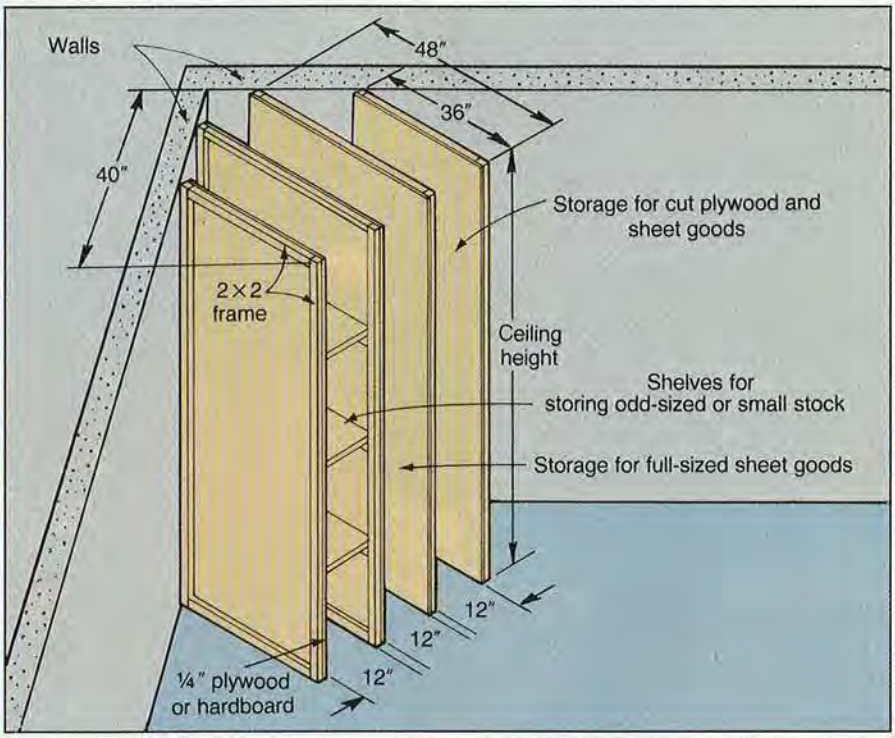
Continued from page 10

Go to a corner to store an abundance of stock

If you have unlimited shop space, stop reading here. For the rest of us, storing project material poses a major problem. Just one full sheet of plywood covers up a big portion of precious wall space.

TIP: Move your materials into a corner. As shown *below,* you can stow everything from full sheets of plywood (if your shop has 8′ or more of headroom) to cut-off pieces into an area that extends only 40″ along each wall. Construct the dividers from plywood and 2×2 stock, and attach them to the floor and ceiling. Add shelves to hold cut-off pieces and small stock, if desired.

—Doug Parker, Grandville, Mich.

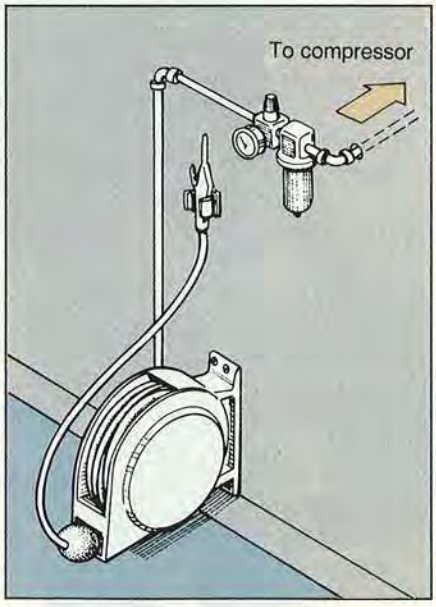


Floor-level air hose keeps a low profile

A wall-mounted retractable reel keeps your air hose handy and protects it, too. Usually, the reel hangs at benchtop height for convenience. But the convenience ends as soon as the reeled-out hose blocks your path around the shop or sweeps a stack of project parts and tools off your benchtop.

TIP: Install the hose reel at floor level. That way, when it crosses your path, you can simply step over it. To keep the hose-end handy, snap it into a conveniently located spring clip, the type used to hang brooms.

—WOOD *magazine's IDEA SHOP*™

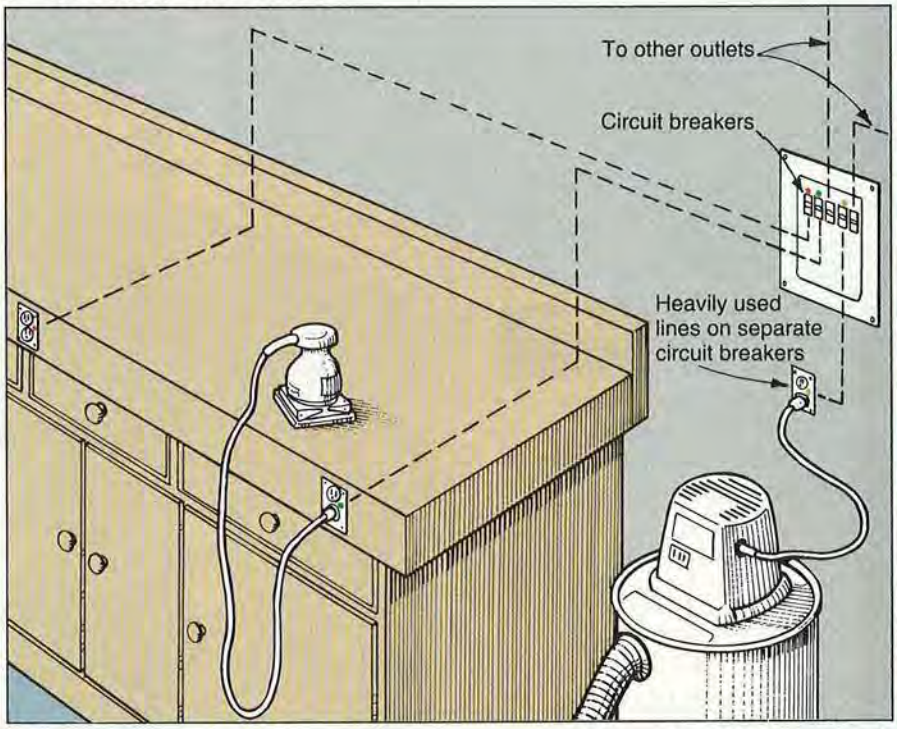


Color-coded outlets help prevent electrical overloads

In some workshops, more than one electrical circuit serves the convenience outlets. Still, a dust collector, a work light, and a tablesaw could pop a circuit breaker if they end up plugged into the same circuit. You need to divide your loads among circuits, not just outlets.

TIP: For each outlet on the same circuit, paint a dot of one color on the outlet plate. (Acrylic artist's colors work great for color-coding.) Identify the circuit breaker in the load center with a corresponding color dot. Designate other circuits with other colors. Now, when you plug in equipment that will be running concurrently, make sure you don't plug too much of it into outlets marked with the same color.

–Bob Blackman, Sunrise Beach, Mo.



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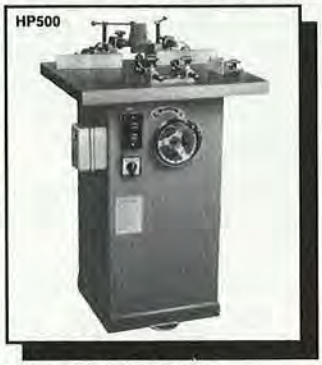

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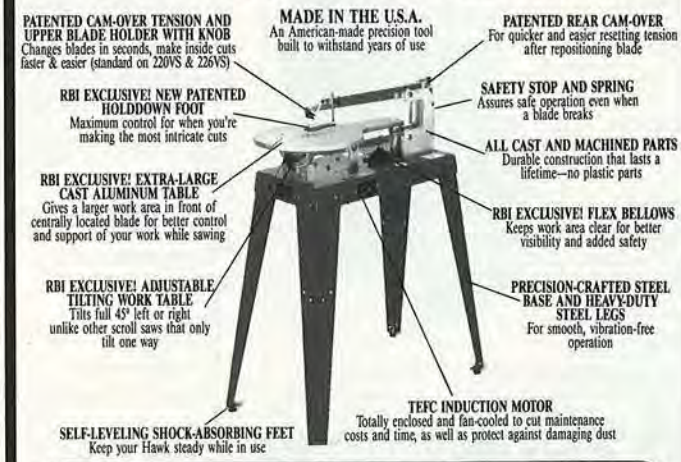
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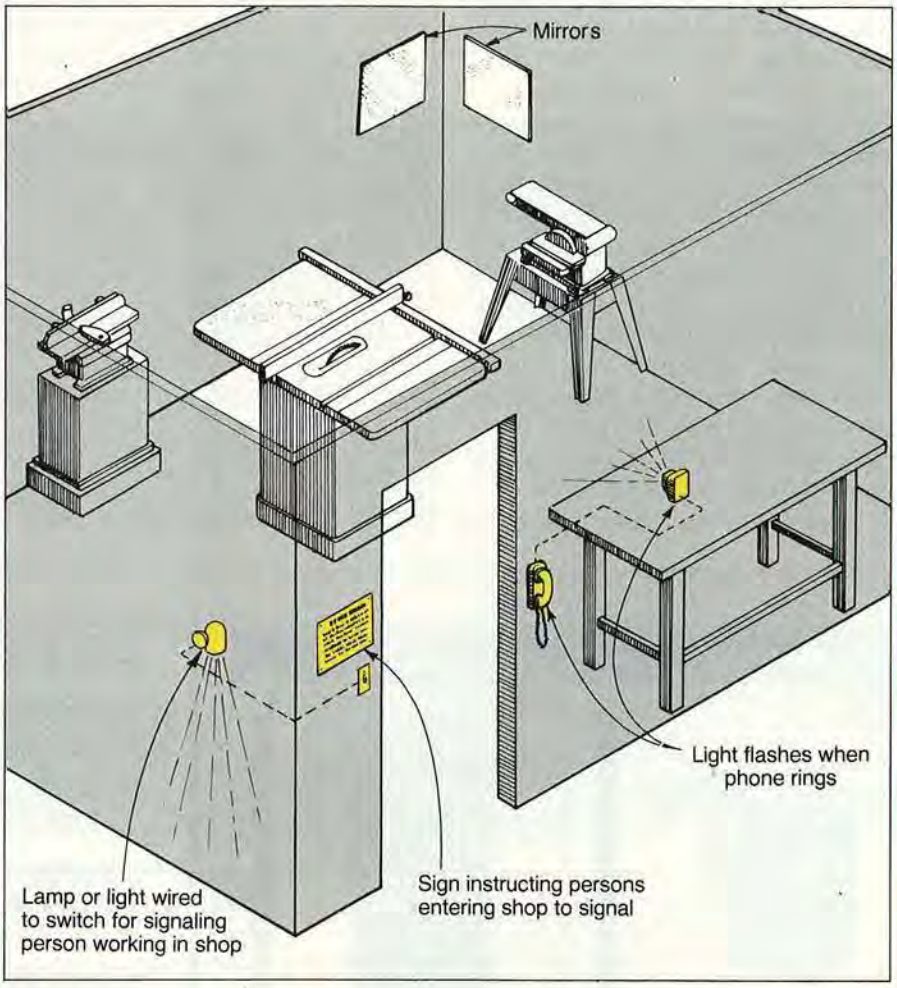
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 13

Flashing lights announce phone calls and visitors

Concentrating on your project with your earplugs in, the dust collector turned on, and a power tool running, it's not surprising that you might not hear the telephone ring. The same situation makes it easy for a visitor to enter your workshop without your knowing. A tap on the shoulder or a greeting from an unnoticed guest is guaranteed to cause a shriek, or worse, an accident.


Mirrors
Light flashes when phone rings
Sign instructing persons entering shop to signal
Lamp or light wired to switch for signaling person working in shop

TIP: To avoid missing telephone calls when you're in the shop, install a flashing-light telephone signal. Radio Shack outlets and other sources sell a plug-in device that connects to your telephone line with a standard modular plug. A lamp (or lamps, up to a stated maximum) plugged into it will then flash whenever the telephone rings. For more visibility, use a colored bulb. Install several lamps or mount mirrors in the corners of the shop so you can see the light from anywhere.

–John Seidel, Smyrna, Ga.

TIP: Visitors won't startle you if you hook up a visual "doorbell" in your shop. Near the entrance, install a switch that controls a lamp inside the shop. Use mirrors or additional lamps if necessary for visibility. Do not use your main shop lights as the signal. Post a large sign instructing persons entering the shop to flip the switch on and off several times, and to wait to be waved in. Make sure that everyone in your household understands the danger of entering the shop unnoticed.

–Edward DeMay, Canandaigua, N.Y.

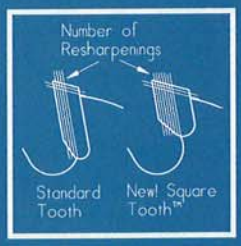
Continued on page 16

Wanna' hear the latest in saw blades? You can't!

You can't, because these new blades are absolutely quiet and vibration-free. All other blades vibrate. If you don't believe us, take the blade you're currently using, hold it by the arbor and tap it with a pen or pencil. Hear the ringing noise? That's the vibration, the same thing that happens when you make a cut. Now, tap the blade on this page. No really — try it! That's what our new blade sounds like.

Vibration does more than just make noise. It causes teeth to dull faster and makes the cut less precise. So how do we eliminate vibration? We laser cut patented anti-vibration reeds right into the blade body. The sound gets trapped in the reeds and there you have it, no vibration.

Effect of vibration in the blade.



Not only is this the quietest blade, but the most precise. Why? Vibration causes micro-chipping on the edge of the workpiece and the kerf width to vary. We've also incorporated Freud's innovative new Square Tooth™ design — by taking the same amount of carbide as in our other blades and reshaping the tooth to make it thicker and shorter. A shorter tooth is less likely to follow the grain of the wood, thus permitting a more precise cut. A thicker tooth will also yield more sharpenings, extending the life of the blade. Also, our Titanium super micro-grain carbide lasts longer between sharpenings than other manufacturers' carbide.

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 14

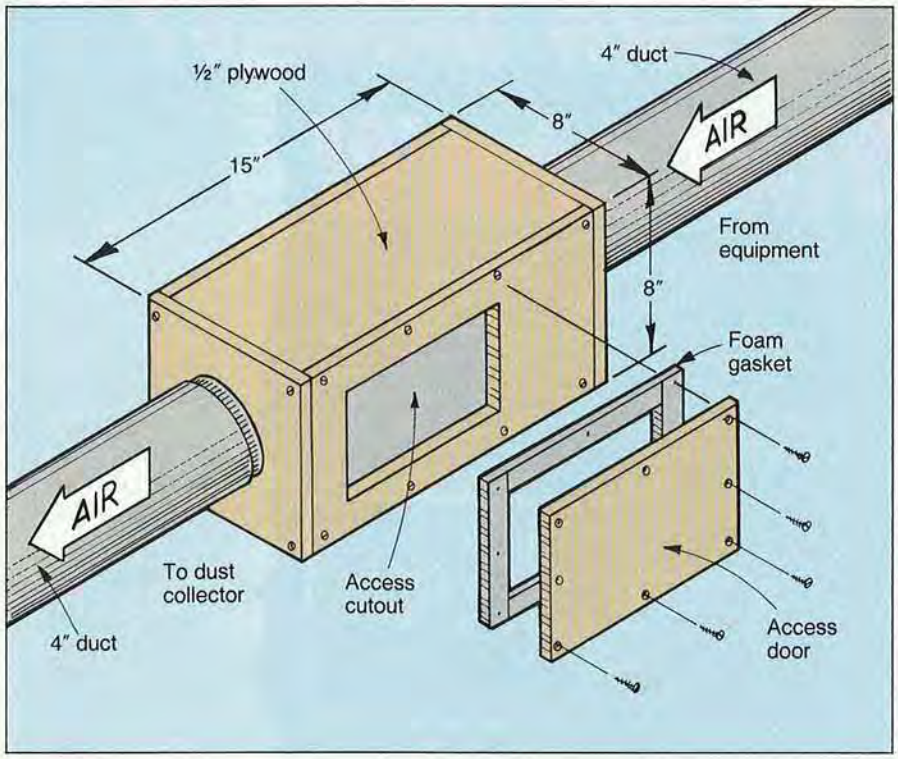
Box protects dust collector

Ka-chang! There goes another large chip or knot through your dust collector. It sure sounds like it could be doing some damage.

TIP: A simple drop box will catch those large pieces before they reach the dust collector. Build your box to the approximate dimensions shown *right*. Locate the inlet and outlet connectors about 2" above the floor of the box. Make tight joints, and use foam weatherstripping for a gasket on the cleanout cover. Install horizontally near the dust collector.

Airborne dust passes through to the dust collector, but heavier pieces drop out of the airstream and collect on the bottom of the box. Clean out the box periodically for maximum effectiveness.

–Bob Colpetzer, Clinton, Tenn.



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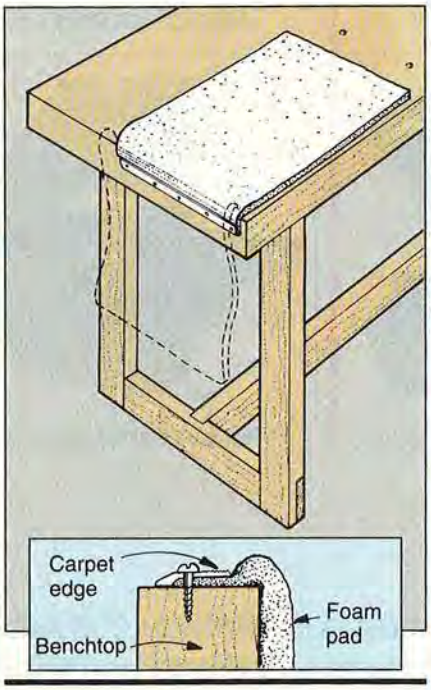
–Chuck Hedlund, Des Moines, Iowa



MORE TIPS FROM OUR WOODWORKING PROS

- Having trouble achieving a smooth paint job? Try Medite instead of plywood. See our notes about it on *page 38.*
- Catch a wave, or at least laminate a decorative veneer wave between two pieces of wood. We'll show you how to do it; turn to *page 40.*
- For knockdown joinery, see the bed bolts on *page 61.*

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—Charlie Breeding, Davenport, Va.

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Continued on page 22

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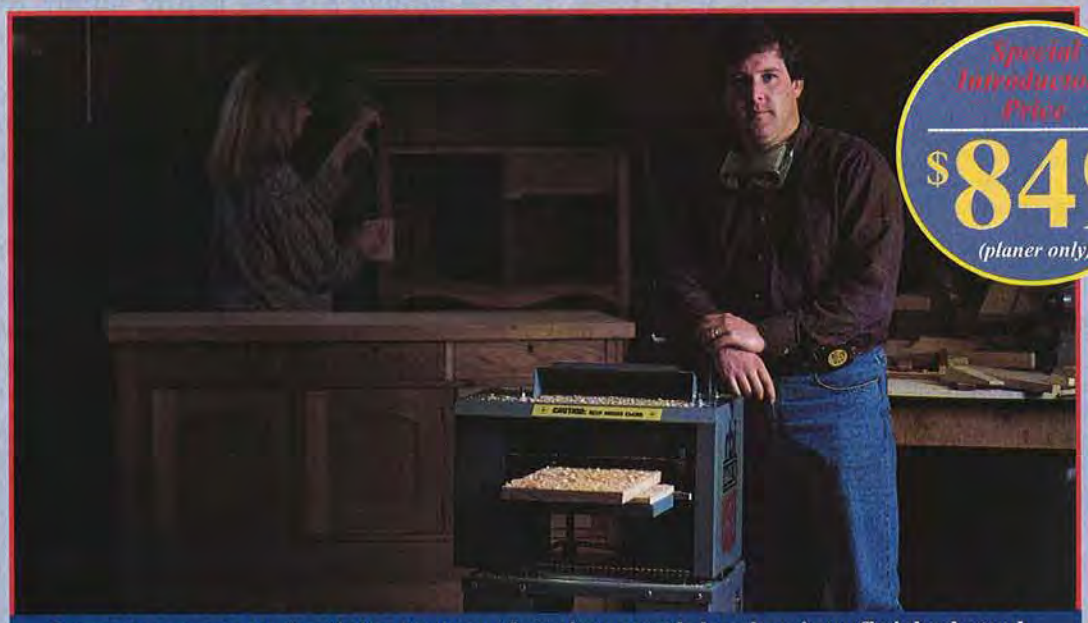

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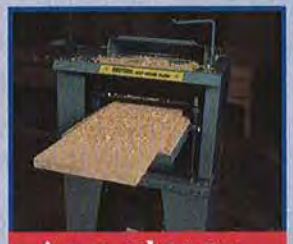

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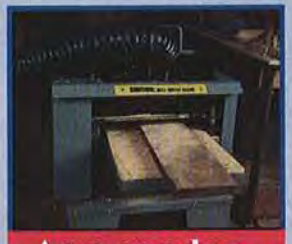

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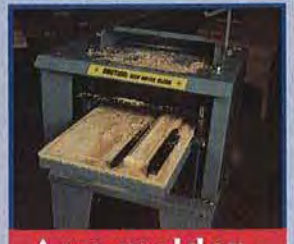

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ASK WOOD

Continued from 20

A lumber sticker in the family tree

I have been doing genealogical research on my family, and have a question that has plagued me ever since I discovered my great grandfather's occupation. He was born in 1831 and lived in southwest Ohio. The census listed him as a "lumber sticker." Do you or any *WOOD* readers know what that was? How did the name originate?

—Jimmy Smith, Beavercreek, Ohio.

Jimmy, unless some of our "old timer" readers respond to the contrary, we believe we've solved the mystery of your great grandfather's occupation. A check with the Forest History Society of Durham, North Carolina, confirmed our suspicion. Your great grandfather was a lumber grader—at that time, and even now, a highly specialized job. He used a scaling stick (thus the label) to determine the volume of logs or boards and was probably employed by a logging company or a lumber mill.

You can remove ink marks on wood

How do you remove those annoying ink marks on boards that come from the lumber store? Should I use a solvent?

—Ryan Sutton, Middletown, Ind.

Ryan, we asked our Project Builder, Jim Boelling, to help answer this one. He says, "Basically, you have only three viable alternatives: scraping, sanding, or cutting off or around the mark. Resist the tempation to use alcohol, lacquer thinner, or acetone to remove the ink marks. The reason: They can actually cause the ink to flow deeper and over a greater area."

Are all Taiwanese look-alikes alike?

Imported machinery—especially tools from Taiwan—proliferates in today's market. Many of these machines look very similar except for differing brand names. Do you have any information on Taiwanese manufacturers? Are there a great many of them? Are some better than others?

—Norman Sherry, Barnesville, Pa.

We talked to Steve Erbach, advertising director for Grizzly Imports. "Yes, Norman, there are many Taiwanese manufacturers, and the quality does vary by manufacturer. Often, quality from the same manufacturer depends on the specifications of the buyer. Most tools are built according to specifications given to them by an importer. Some importers choose higher grades of parts—switches, wirings, and bearings. Others are interested in buying the cheapest product available. In the end, we advise going with a company, like ours, that services what they sell, and always stocks parts."

Continued on page 24

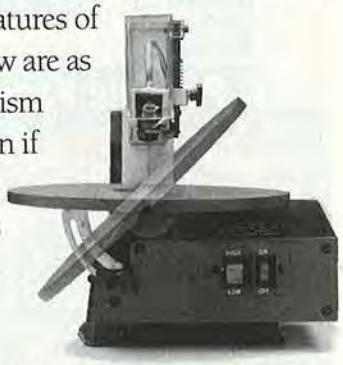
What it takes to cut it as a Consumers Digest Best Buy.

You don't get named a *Consumers Digest* Best Buy without working at it. You have to be an *outstanding* value. That's the Dremel 1671 Scroll Saw.

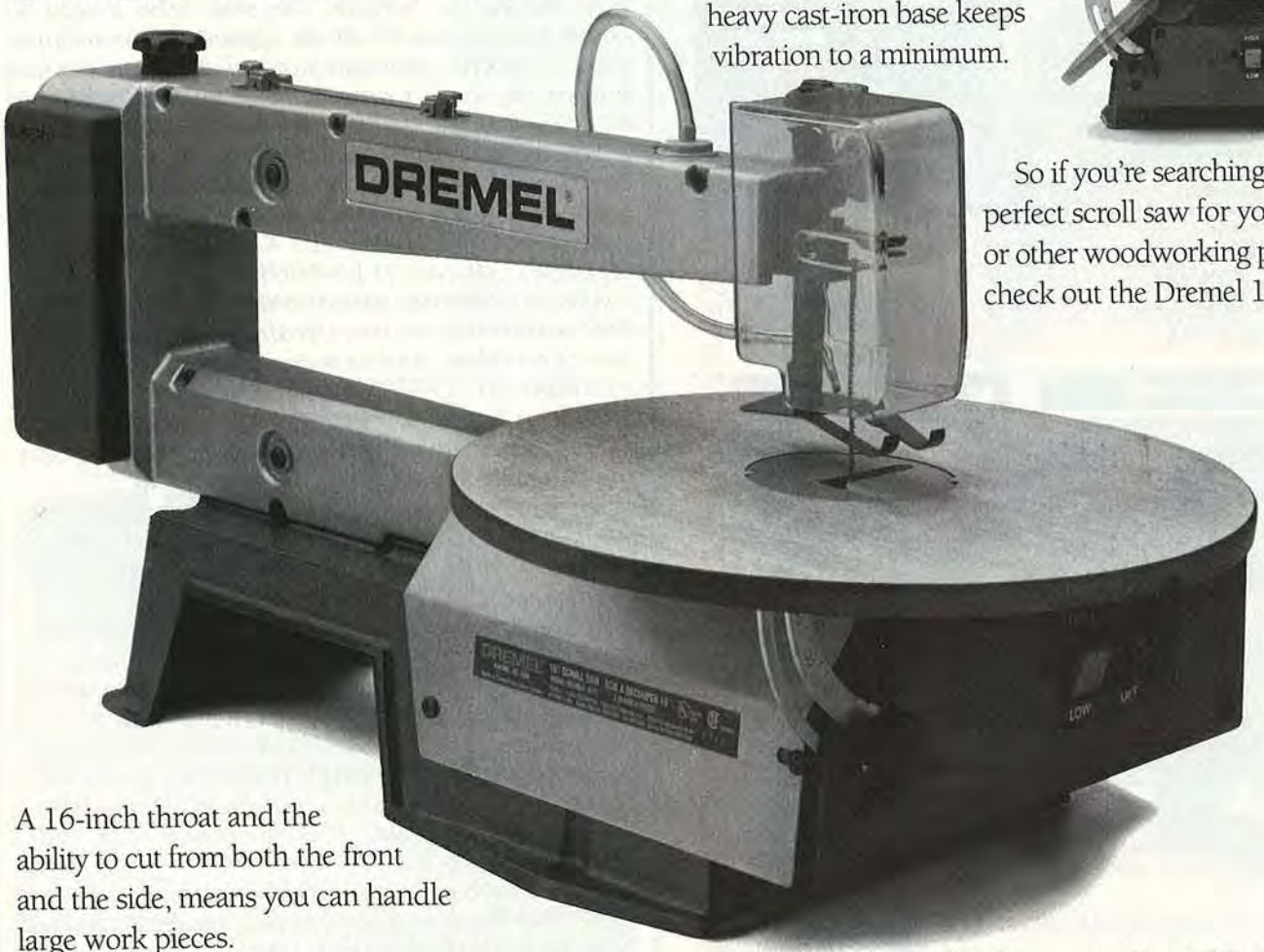
The Dremel 1671 has a lot of features that make it a pleasure to use. It has two cutting speeds and a powerful motor that lets you buzz through wood up to two inches thick, as well as sheet metals and plastics.

The sturdy, 12-inch cast aluminum table is adjustable from 0° to 45° for accurate bevel cuts up to 1-inch thick.

Of course, not all the features of the Dremel 1671 Scroll Saw are as obvious. A special mechanism quickly stops cutting action if the blade breaks. And the heavy cast-iron base keeps vibration to a minimum.

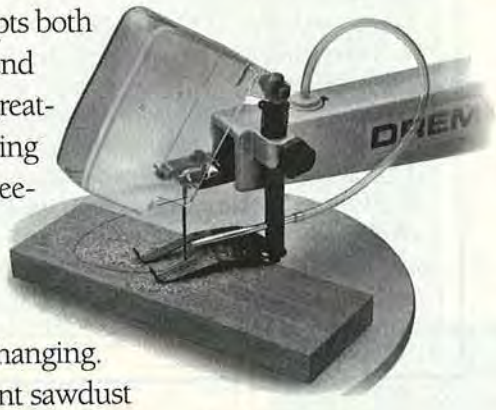


So if you're searching for the perfect scroll saw for your craft or other woodworking projects, check out the Dremel 1671.



A 16-inch throat and the ability to cut from both the front and the side, means you can handle large work pieces.

The saw accepts both plain- and pin-end blades, for the greatest possible cutting versatility. The see-through blade guard pivots out of the way for easy blade changing. And a convenient sawdust blower keeps your cutting line clear for accurate cuts.



And see why *Consumers Digest* placed it a cut above the rest.

For a free copy of the *Dremel Scroll Saw Blade Application Guide* write to: Dremel, Dept. S-W, P.O. Box 1468, Racine, WI 53406-1468.

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ASK WOOD

Continued from page 22

Where can I get more training?

I'm currently in the Air Force and am planning on retiring and opening an antique restoration business in Virginia soon. I really enjoyed your article on the Dakota Technical Institute (issue 49, *page 46*). I would love to find a similar school in my area so I can learn furniture construction, restoration, and finishing. Do you have a listing of these?

—David Taylor, Lt. Col., USAF

Dave, we contacted John Rybski with the National Association of Furniture Repair and Refinishing Specialists. He located Mark Weathersby, a furniture restorer in Norfolk, Virginia, who would be happy to take you on as an apprentice, or set up a special training program for you. You can contact him at his store, Craftsmanship by Weathersby, at 804/362-8412.

You should also contact the above association. They are just starting up, but they hope to become a comprehensive resource for folks just like you. Write them at NAFRRS, 321 S. Houghton, Milford, MI 48381. Or call 313/684-6411.

Also, a company called Minuteman offers excellant refinishing seminars, training programs, a full line of products, and technical support. Contact the company at 115 N. Monroe St., Waterloo, WI 53594; or call 800/733-1776.

And, here's a partial listing of some schools offering intensive woodworking programs:

- *Penland School of Crafts: offers courses for beginning and experienced woodworkers. Write Penland, NC 28765. Call 704/765-2359.*
- *Anderson Ranch: summer seminars in fine woodworking and furniture design taught by master craftspeople. Write P.O. Box 5598, Snowmass Village, CO 81615. Call 303/923-3181.*
- *Oregon School of Arts and Crafts: fine woodworking and finishing. Three-year program, open quarterly classes, and workshops. Write 8245 SW Barnes Rd., Portland, OR 97225. Call 503/297-5544.*
- *Rockingham Community College: two-year fine and creative woodworking program, and a six-week basic program. Write P.O. Box 38, Wentworth, NC 27375. Call 919/342-4261.*
- *Yestermorrow: one-week basic, intermediate and advanced cabinetry, and two-week tutorial workshops. Studies aimed at students' specific interests. Write Design/Build School, RR 1, Box 975, Warren, VT 05674. Call 802/496-5545.*
- *Dakota County Technical College: beginning and advanced wood finishing. Write to the school at: 1300 145th St. East, Rosemount, MN 55068. Call 612/423-2281.*

Print this article

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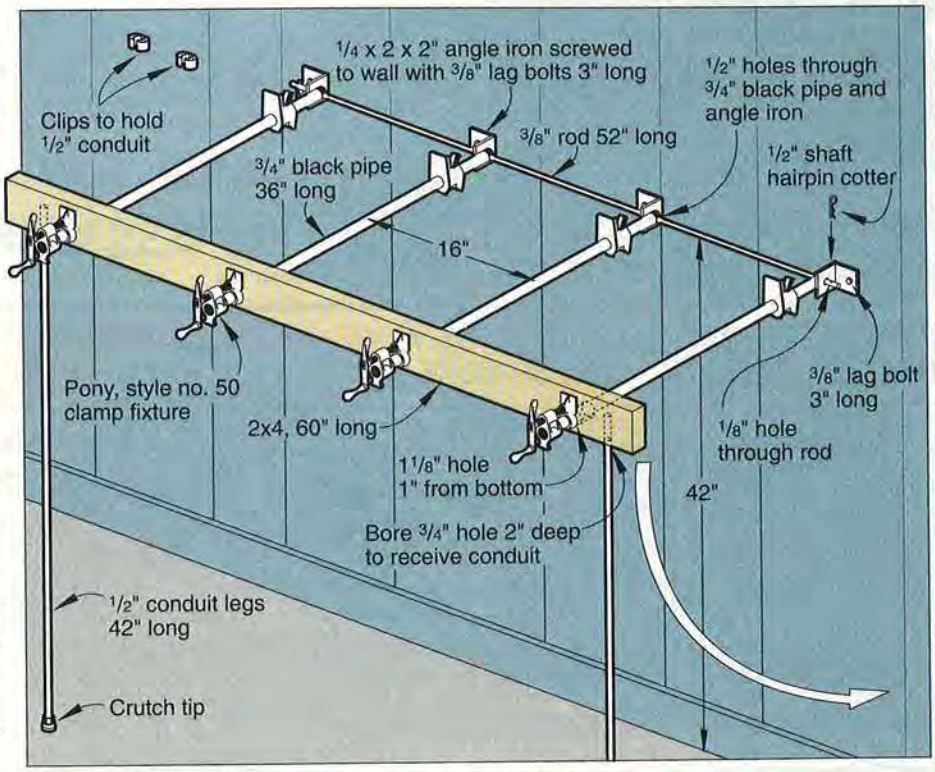
Edge-join panels of all kinds with this wall-mounted, fold-down clamp rack. The 2×4 along the front edge and ⅜" rod along the back align and support the pipe clamps for flat laminations. When the rack is not in use, remove the conduit legs and drop the rack down against the wall, making for more work space. In a pinch, you can also clamp a piece of plywood in place and use the rack as a temporary worktable.


1/4 x 2 x 2" angle iron screwed to wall with 3/8" lag bolts 3" long
1/2" holes through 3/4" black pipe and angle iron
Clips to hold 1/2" conduit
3/8" rod 52" long
1/2" shaft hairpin cotter
3/4" black pipe 36" long
16"
Pony, style no. 50 clamp fixture
3/8" lag bolt 3" long
2x4, 60" long
1/8" hole through rod
11/8" hole 1" from bottom
42"
Bore 3/4" hole 2" deep to receive conduit
1/2" conduit legs 42" long
Crutch tip

Project Design: Loyal Downing Illustration: Roxanne LeMoine

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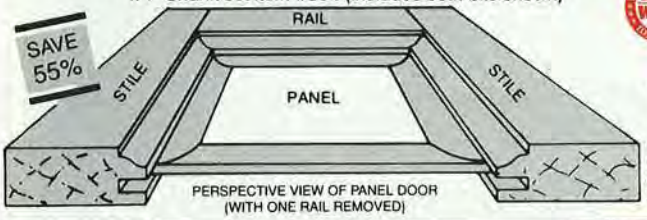
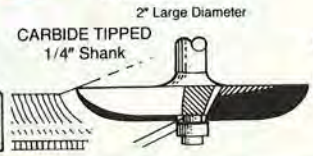


RAISED PANEL BIT SUPPLIED WITH BALL BEARING



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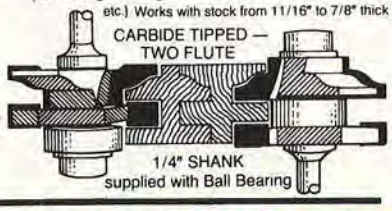

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#904		3/8" Spiral Cutter		3/8"	1"	1/2" *	$24.00
#905		1/2" Spiral Cutter	*Proper Adaptor Will Be Supplied	1/2"	1 1/2"	1/2"	$29.00
#530		3/16" Edge Beading	3/16" Dia. of Circle		1/2"	1/4"	$15.00
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#350		1/8" Round Over	1/8" R	3/4"	3/8"	1/4"	$11.00
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#230		1/4" Round Over	1/4" R	1"	1/2"	1/4"	$12.00
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#355		1/2" Round Over	1/2" R	1 1/2"	3/4"	1/4"	$17.00
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#199		Multiform Moulding	Unlimited Patterns	2 1/4"	2"	1/2"	$40.00
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#206		3/8" Cove	3/8" R	1 1/4"	9/16"	1/4"	$13.00
#207		1/2" Cove	1/2" R	1 1/2"	5/8"	1/4"	$14.00
#643		1/2" Cove	1/2" R	1 1/2"	5/8"	1/2"	$15.00
#208		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	$26.00
#231		5/32" Roman Ogee	5/32" R	1 1/4"	15/32"	1/4"	$16.00
#232		1/4" Roman Ogee	1/4" R	1 1/2"	3/4"	1/4"	$17.00
#506		1/2" Pattern	Flush Trim	1/2"	1"	1/4"	$15.00
#508		3/4" Pattern	Flush Trim	3/4"	1"	1/4"	$17.00
#366		1/8" Slot Cutter	3/8" Deep	1 1/4"	1/8"	1/4"	$14.00
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#211		3/8" Core Box	round nose	3/8"	3/8"	1/4"	$10.00
#212		1/2" Core Box	round nose	1/2"	11/32"	1/4"	$13.00
#418		3/4" Core Box	round nose	3/4"	5/8"	1/4"	$15.00
#213		1" Core Box	round nose	1"	3/4"	1/2"	$17.00
#548		Lockmitre		2"	7/8"	1/4"	$32.00
#214		1/4" Straight	plunge cutting	1/4"	3/4"	1/4"	$ 6.50
#216		3/8" Straight	plunge cutting	3/8"	1"	1/4"	$ 6.50
#474		1/2" Straight	plunge cutting	1/2"	1"	1/4"	$ 7.00
#219		3/4" Straight	plunge cutting	3/4"	1"	1/4"	$ 9.50
#779		3/4" Straight	plunge cutting	3/4"	1 1/2"	1/2"	$10.00
#462		1/2" Bull Nose	1/2" Dia. of Circle		3/4"	1/4"	$16.00
#464		3/4" Bull Nose	3/4" Dia. of Circle		1"	1/4"	$21.00
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#545		Tongue & Groove	Straight	1 5/8"	1"	1/4"	$29.00
#845		Tongue & Groove	Straight	1 5/8"	1"	1/2"	$29.00
#546		Tongue & Groove	Wedge	1 3/16"	1"	1/4"	$29.00
#846		Tongue & Groove	Wedge	1 5/8"	1"	1/2"	$29.00
#450		1/8" Beading	1/8" R	3/4"	3/8"	1/4"	$11.00
#233		1/4" Beading	1/4" R	1"	1/2"	1/4"	$13.00
#454		3/8" Beading	3/8" R	1 1/4"	5/8"	1/4"	$15.50
#455		1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	$17.00
#500		3/8" Flush Trimming		3/8"	1/2"	1/4"	$ 7.00
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#221		1/2" Flush Trimming		1/2"	1 3/16"	1/2"	$ 8.00
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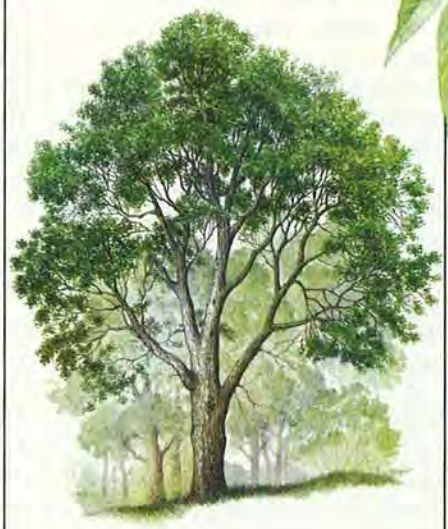
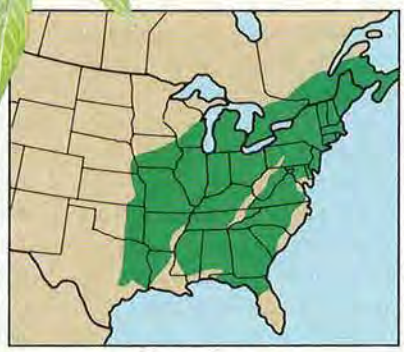
Anyone who has ever dug a hole with a spade, gathered leaves with a rake, or chopped weeds with a hoe has touched white ash. The tough, resilient wood leads hickory for handles on nonstriking tools.

Although white ash indeed classifies as utilitarian, it bests all woods in a sporting role. Wooden baseball bats (still the mainstay in pro leagues) have always been made of white ash. Before man-made fibers, it was also the wood of choice for tennis rackets and skis. You'll also find white ash as hockey sticks, polo mallets, oars and paddles, and playground equipment.

Chairmakers also prefer white ash due to its bending ease. And its workability, plus good looks, make white ash one of the top commercial woods in the furniture and cabinet industries.





Natural range

Wood identification

White ash (*Fraxinus americana*) grows from the East to the Midwest. Green ash and blue ash—with somewhat weaker wood—share the same range, and commercially, they're harvested and marketed together.

Preferring the well-drained loam soil found in river valleys, white ash can grow to 120′ tall and a diameter of 6′ with nearly half the trunk height clear of branches. You won't find it in pure stands, though. Instead, the tree likes a mix of neighbors—hardwoods in the South, conifers in the North.

The name "ash" may originally have come from the gray color of the tree's flat-ridged bark that's cross-hatched with diamond shapes. As does walnut, white ash produces leaves 8″ to 12″ long that are made up of five to nine lance-shaped leaflets, each about 5″ long. Near the leaves hang the fruit of last year's growth—clusters of tan paddle-shaped wings with seed cases.

White ash differs in color from black ash (often called brown ash), its cousin in the market. White ash looks lighter—although it's actually tan, not white. And even flat-sawn white ash can display bird's-eye, fiddleback, and quilt-pattern figure.

The wood of white ash nearly matches hickory's rating in strength, stiffness, and hardness. Yet, at 41 pounds per cubic foot, cream-colored white ash is lighter and easier to work. Although somewhat course-textured, white ash generally has straight and even grain.

Uses in woodworking

You can use white ash for any woodworking project that you would red oak: chairs, tables, desks, and cabinets. Although durable to exposure from the elements, it won't, however, weather as well as white oak in outdoor projects.

Carvers and woodturners view white ash the same as red oak. Its hardness and coarse grain make it difficult to work.

Availability

Within white ash's natural range, dealers that stock hardwoods should carry an abundant supply of white ash at about $2.25 per board foot. And wide boards are usually available. Some dealers may even carry 3″-diameter bat blanks and furniture squares.

Ash plywood costs about $60 per sheet in ¾″ thickness. You'll also find ash veneer, in sheets and as edge-banding, carried by cabinetmaking suppliers.

Continued

PERFORMANCE PROFILE

white ash
(Fraxinus americana)

Flat-sawn white ash

Bird's-eye white ash

From board to board, flat-sawn white ash can have some real wild grain. If that's not the look you like, you'll want to handpick for more subtle stuff. On the other hand, you can combine boards with figure, contrasting grain, and "defects" such as flecks from burrowing insect larvae (long deceased!), for eye-catching pieces.

Once you have your white ash, remember that it *is* hard, so expect the wood to have a moderate blunting effect on your hand or power tools. For best results, plan on sharpening your tools before you begin, and then again during the project. With power tools, you may want to tackle white ash with carbide-tipped cutters. Otherwise, the following suggestions will help you work this wood.

Machining methods

- Nearly as hard and as dense as sugar maple, white ash burns easily if you use dull or dirty blades and cutting edges. And the burns won't easily sand off.
- Avoid burning when ripping the resistant wood by choosing a rip-profile blade with no more than 28 teeth. Then, don't force-feed it.
- Be sure to feed white ash to the jointer so that the knives' rotation follows the grain direction, or the wood will chip. Feed figured wood slowly and at a slight angle.
- Avoid burning and chipping with your router by taking shallow passes on the wood. In end-grain and all cross-grain passes, use a backing board on the exit side to eliminate chipping.
- Always use pilot holes for nails and screws, and drill them with brad-point bits to eliminate wander.
- White ash's hardness means that you can't skip grits when sanding or the wood scratches, and they're hard to get out. It can, though, be sanded glass-smooth.
- Although the wood readily accepts all types of adhesive, it is slow to absorb, so a glue with a longer open time (white glue) performs better.
- Unlike maple, white ash won't give you any problem in staining, and filling the grain for smoothness isn't necessary.

Carving comments

Carvers haven't traditionally been drawn to white ash. Maple-like in hardness, but failing to take fine detail, the wood probably seems more trouble than it's worth. But if you want to carve white ash, treat it like red oak:

- Do rough-in work with a deeper bevel (25°–30°), and then grind to a shallower bevel (15°–20°) for details.
- Don't attempt long slices with the grain because the wood will splinter. Instead, take shorter strokes and use stop cuts.

Turning tricks

Again, pretend you've encountered a really hard piece of red oak, and turn accordingly.

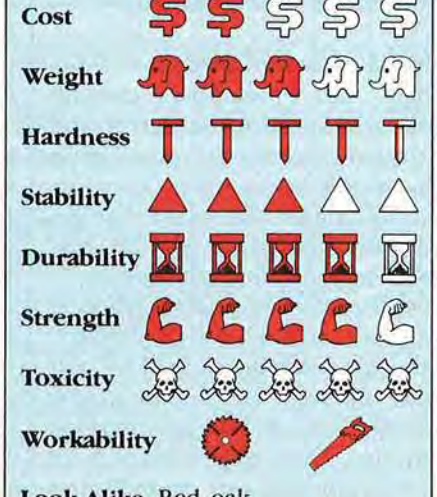
- Use only the very sharpest tools.
- Counter splintering by taking shallow cuts.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and tips pertaining to this issue's featured wood species—appear under headings elsewhere on this page.

- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed wood with figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".
- For clean cuts, rip with a rip-profile blade with 24–32 teeth. Smooth cross-cutting requires at least a 40-tooth blade.
- Avoid using twist drills. They tend to wander and cause breakout. Use a backing board under the workpiece to reduce tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.
- Carving hardwoods generally means fairly shallow gouge bevels—15°–20°—and shallow cuts.

WHITE ASH AT A GLANCE



Look-Alike Red oak

Compiled with woodworkers Jim Boelling, Chuck Hedlund, Pete Stephano

WHERE REALISM RIDES THE WAVES

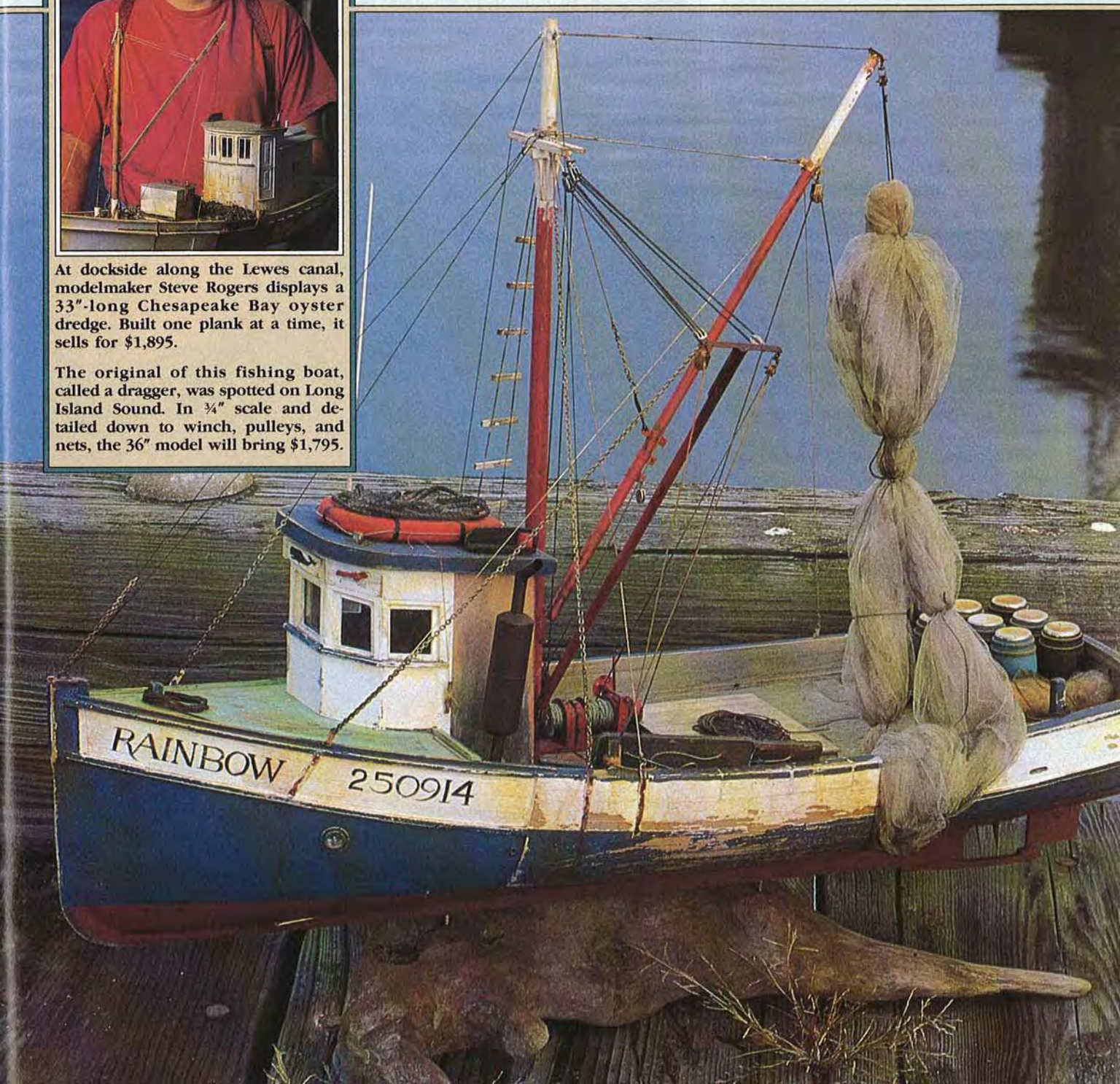
Print this article

To Lewes, Delaware, craftsman Steve Rogers, there's nothing prettier than a boat beat up and battered by daily toil.

Continued

At dockside along the Lewes canal, modelmaker Steve Rogers displays a 33″-long Chesapeake Bay oyster dredge. Built one plank at a time, it sells for $1,895.

The original of this fishing boat, called a dragger, was spotted on Long Island Sound. In ¾″ scale and detailed down to winch, pulleys, and nets, the 36″ model will bring $1,795.



RIDES THE WAVES

Master modelbuilder Steve Rogers doesn't build sleek yachts, clipper ships, or warships of history. He crafts and sells workboats, the unkempt but oceangoing hangers-on from the days when men could make a decent living pulling catches from the sea. To him, these boats are an endangered species, threatened by replacements of fiberglass and aluminum. And when they're gone, the practical craftsmanship of the watermen they represent will have passed, too.

"You know, when watermen are working, they don't take real good care of their boats," says Steve, a glimmer of amusement starting across his face. "They just do what they have to do."

Steve continues, "I was down in North Carolina on the barrier islands scouting for boats. I saw this pie-shaped skiff pulled up on the bank. It was unusual, so I took some photos and made a few measurements. Awhile later, I met a local man and asked him if the one I'd seen was pretty common." Steve stifles a snicker.

"He said it was pretty common all right. He called it an accident boat. You see, somehow the stern end had gotten smashed. But rather than pull it out of service to rebuild, the owner had simply cut the bashed part off and sealed the cutoff end by nailing on a couple of boards!"

Naturally, Steve went home and built a scale model of the awkward-looking craft. And as usual, his model faithfully reproduced the original. "It was so ugly, I couldn't sell it," he laughs.

Craft born of necessity

Although Steve had studied anthropology in college, the subject's relevance was buried for years in an advertising career he groomed in Delaware. But it finally surfaced when he began building models full-time in 1989 at his Lewes home. Now Steve, 48, not only knows how workboats

For the look of oyster shells, Steve piles up coquina, a mixture of tiny shells and fragments he gets from Florida. A sprayed-on mixture of water and black drafting ink gives the boat a layer of grime. Painted rust adds to the realism.

Opposite page. **Complete with cloth sails, Steve's 1"-scale North Carolina sprits'l skiff has a price of $295. It's 20" long. Boats like these, the craftsman believes, are slowly but surely headed for extinction.**

are built, but why they came to be that way.

"Most of the old boats are a reflection of the body of water they work in," he says as he studies the unfinished hull cradled in his hands. "For instance, Chesapeake Bay is characterized by chop—short intervals between waves of two or three feet high. And that just pounds the boats constantly. So a lot of the Chesapeake Bay boats have two things in their construction that make them withstand that."

He holds the hull up and slowly turns it. "The first thing is they are heavily built so they can take the constant pounding. In a New England lobster boat, for example, the planks might be 1" thick. But on a Chesapeake Bay boat they will be 1¼"."

Rotating the hull in his hands to peek inside, he continues. "The second thing is that the Chesapeake Bay boat uses a heavy log keelson which also serves as the structural back-bone piece inside. And the reason they call it a log keel is because, at first, that's exactly what it was. They went out and found a tree, and then hewed it to shape. So, here is this 10x10 running the length of the boat!"

But there's an evolutionary side to Chesapeake Bay boatbuilding, too. And Steve knows the story.

"All modern working power boats on Chesapeake Bay are derived from the original sailboat, which is popularly called the skipjack, but better known by watermen as the bateau," he explains. "And, some say, the skipjack comes from the New England sharpie, a glorified row boat. They're flat-bottomed, and were rowed or sailed. Nothing sophisticated. But they were cheap and easy to build. You didn't have to be a shipwright." Like the watermen, Steve keeps his model building simple, too.

Trimming workboats down to size

Although Steve sometimes built from kits long ago when model-making was only a hobby, today he relies on actual boat measurements and photographs he takes on the spot. Sometimes, though, plans are a big help. "There is a catalog of old ship plans [detailed hull-line drawings, not the project-type plans familiar to woodworkers] that you can buy from the Smithsonian. I've used them to develop hull lines for forms and wooden masters," Steve says. Mostly, though, he relies on his practiced eye, skilled hands, and construction knowledge to shape the wood—part by part—into the completed whole. Size, though, always rates high in his planning.

In his sunlit shop on an enclosed porch, Steve rips 3/32"-thick pieces of Idaho white pine for planking. His benchtop saw is sized for the work.

For showing detail, Steve likes to make his boat models as large as possible. Of course, there are some limits.

"If they're intended to sit on someone's coffee table or fireplace mantel, then I can't build them much more than a few feet long," he says. "That's where scale becomes important."

For models, 1" scale (1/12) means that 1" equals 1' on the real boat. A model built to ½" scale (1/24) is half that, with ½" equalling 1' on the full-sized boat. In between, there's ¾" scale (1/18). All translate to the length of the finished model." In other words, as Steve explains: "If I choose 1" scale for a 40' boat, the model is going to be 40" long."

Okay, but does Steve stick with scale throughout all the parts? That seems too tedious. Here's where Steve's knowledge of boat construction pays off.

RIDES THE WAVES

"In most boats under 17′ there is some part that is 1″ square, but hardly anything smaller than that. Then, there are some 1¼″ or 1½″. In one-inch scale, a part dimensioned to 3/32″ is close enough to look like 1″, or even 1¼″ and 1½″" he comments. "Besides, nobody in the commercial fishing world gets that precise."

Miniature materials

The first boats on the Chesapeake Bay—in fact, until right after the Civil War—were made by lashing long logs of yellow pine together, then hollowing them out and shaping them. But as boat designs evolved, they also become more refined, with planks and ribs replacing the logs. "Face it," he says. "A waterman didn't call in an engineer, he found simple solutions." So does Steve.

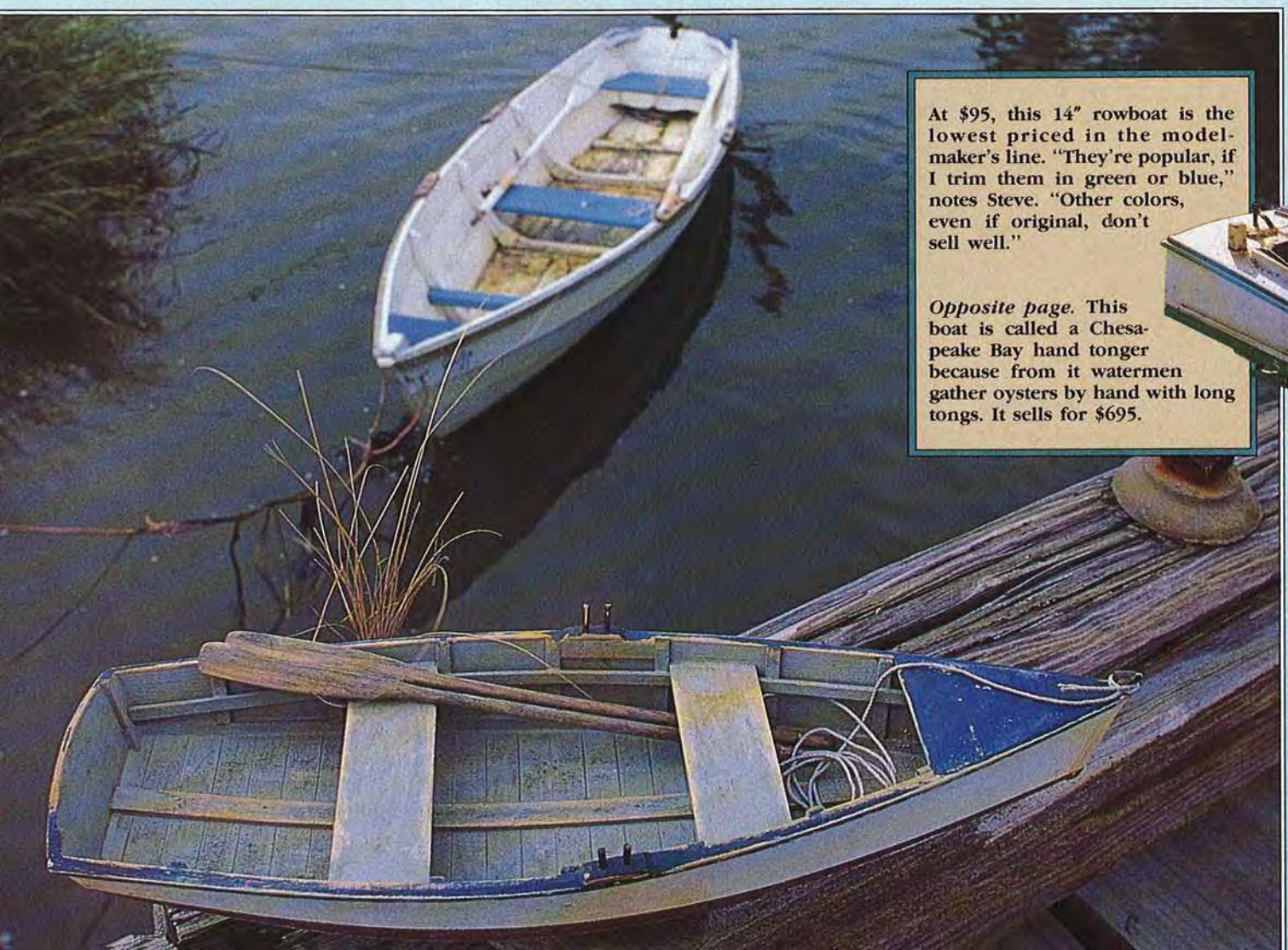
"Mostly, I like to use Idaho white pine. It's straight-grained, doesn't have a lot of knots, and I can find it at a local home center," he says. "Sugar pine works great, too, but it's harder to come by. The main thing is to have straight, rather tight grain. That's for planking and trim. For ribs that have to be bent, I like yellow poplar. For some small trim pieces I buy basswood, and then I also use some model-grade aircraft plywood in 1/64″ thickness—both of which I get at hobby stores that sell stuff for model airplanes."

"For framework and other structural members, it doesn't matter how you cut the wood," Steve says. "But for planking and trim, I have to have edge-grain."

To get it, he gang-rips his ¾″ boards into 3/32″ slivers at his benchtop tablesaw that sits at one end of the shop. "In the model, I'm concerned with the plank's width, because you really can't tell its thickness. I've found that 3/32″ gives me strength but not too much stiffness," he notes.

Steve crafts the aircraft plywood into deck and cabin structures, or uses it to simulate repairs. "Engine covers, roofs, even spot repairs would have been done with plywood on a work boat because it was handy," he says.

Steve's fasteners fall into three categories: brads, nails, and sequin pins. His brads are 20 gauge and ½″ long, the smallest you can buy. "I 'clamp' the planking to the framework with them until the glue sets, and sometimes even leave them in because when they're sunk below the surface, they're really hard to see," he notes. "When I need more hold-



At $95, this 14″ rowboat is the lowest priced in the model-maker's line. "They're popular, if I trim them in green or blue," notes Steve. "Other colors, even if original, don't sell well."

Opposite page. **This boat is called a Chesapeake Bay hand tonger because from it watermen gather oysters by hand with long tongs. It sells for $695.**

ing power, I go to nails about the same size. I go back and pull the nails out with a needlenose pliers because their heads would look out of scale. After painting, the dimples swell and close. The pins hold real thin pieces, and I can leave them in because they look like a carriage bolt."

Steve supplements his brads, nails, and pins with masking tape and wooden spring-type clothespins. And in addition to the yellow glue, he relies on fast-setting cyanoacrylate to instantly bond unlike materials.

Of course, all modelers call on a variety of other materials also. Steve, for instance, cuts 22-gauge tin for plates and patches. Then, for steel, there's the roll of aluminum with adhesive backing made for automotive bumper repair. It can be primed and painted. Add to this cotton mason's twine for rope, carpet thread and kite string for lines, and several gauges of steel and copper wire for cables.

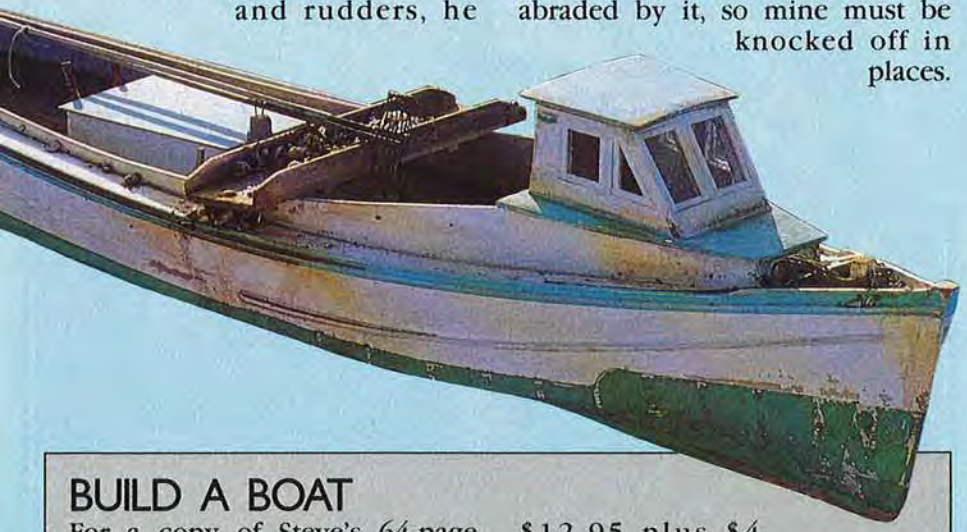
For sails, Steve calls upon his wife, Patricia. A fabric artist, she always has unbleached cotton muslin and sewing thread. Ship's fittings, such as wheels and rudders, he buys from hobby shops or mail-order suppliers he finds in model-makers' magazines.

How to paint grungy

Steve has the perfect description of the look he achieves: "It's as if you were at a Maryland waterfront and spotted a boat that just went out that morning and got some oysters or crabs," he says. "It's what I call low-level maintenance. Watermen don't want their boats to sink, but they're not into superficial appearance."

Regardless of a boat's ultimate grungy look, Steve starts all paint jobs rather conventionally. "I prime the inside of the boat with a solvent-based primer in a spray can to protect the glue joints," he explains. "Next, I add latex ceiling white, sometimes colored with acrylic artists paints, over the primer and to the outside of the hull. This thick paint gives it the 12-coat, brushed look."

Steve separates bottom, deck, and hull colors with masking tape. But being too careful doesn't pay. "There is always wood and stuff in the water," he says, "and paint at the waterline is always abraded by it, so mine must be knocked off in places.



BUILD A BOAT

For a copy of Steve's 64-page book *Model Boat Building Made Simple* (Steve and Patricia Rogers, 1992, Schiffer Publishing, West Chester, Pa.) containing color photos and step-by-step instructions for a rowboat, send $12.95 plus $4 postage and handling (US) to:

Steve Rogers
Bay Built Ship Models
227 Second St.
Lewes, DE 19958.

Top. **To shape poplar into ribs, Steve tacks them to a master form. The strips were first soaked in ammonia for a week.** ***Above.*** **The outward-flaring ribs push against the secured planks, holding them in place until the glue dries.**

"On the metal, nobody primes it good anyway, so they have a problem making paint stick. To recreate that, I put tape over the paint and then pull it up."

When Steve completes the painting, sanding (to imitate wear), and other details, his models receive still another touch of realism—a weathering wash. With an airbrush, the modeler applies a heavy coat of waterproof black drafting ink and water mixed to a medium gray. "It might take several coats to get it right," he says.

Finally, Steve mixes up a dull red, black, and brown to a rust color. He adds that wherever salt water would have rusted metal. For more detail, he'll go back and pick at little areas inside the boat with a knife point so that they splinter. "If I put in some black," says Steve, "they'll appear as areas of dry rot." A nice touch.

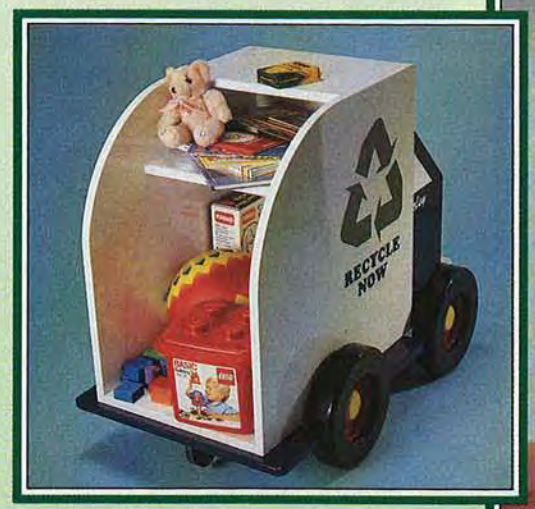
Written by Peter J. Stephano
Photographs: Steve Uzzell

KEEP-ON-RECYCLING TOY BOX

Print this article

It makes picking up toys tons of fun!

What better way to teach children the valuable lesson of recycling than with this roll-around toy-box truck? Simply let your kids know that at the end of playtime all the toys go into the roomy open storage areas at the rear of the truck or under the seat. They just might jump at the opportunity to help out.



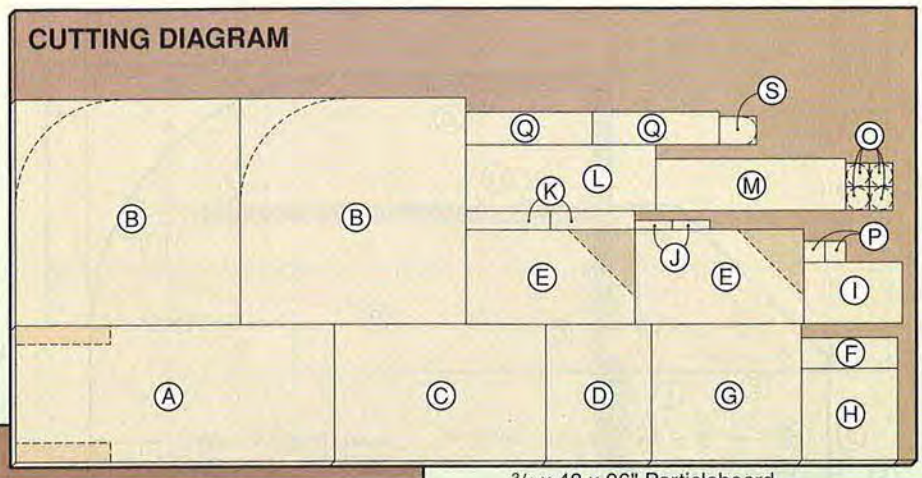
Start with the chassis and box

Note: *To construct this project, you have your choice of several types of sheet goods. AB birch plywood and particleboard work fine. The edges of plywood always require extra effort for a flawless finished appearance.*

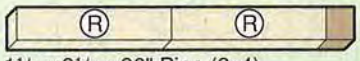
Because of its paintability (we found the painted surface of this product smoother than either par-

Text continued on page 36

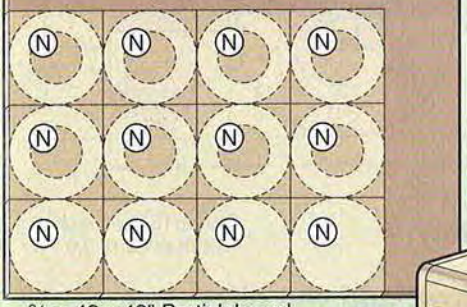
CUTTING DIAGRAM



3/4 x 48 x 96" Particleboard



1 1/2 x 3 1/2 x 36" Pine (2x4)



3/4 x 48 x 48" Particleboard

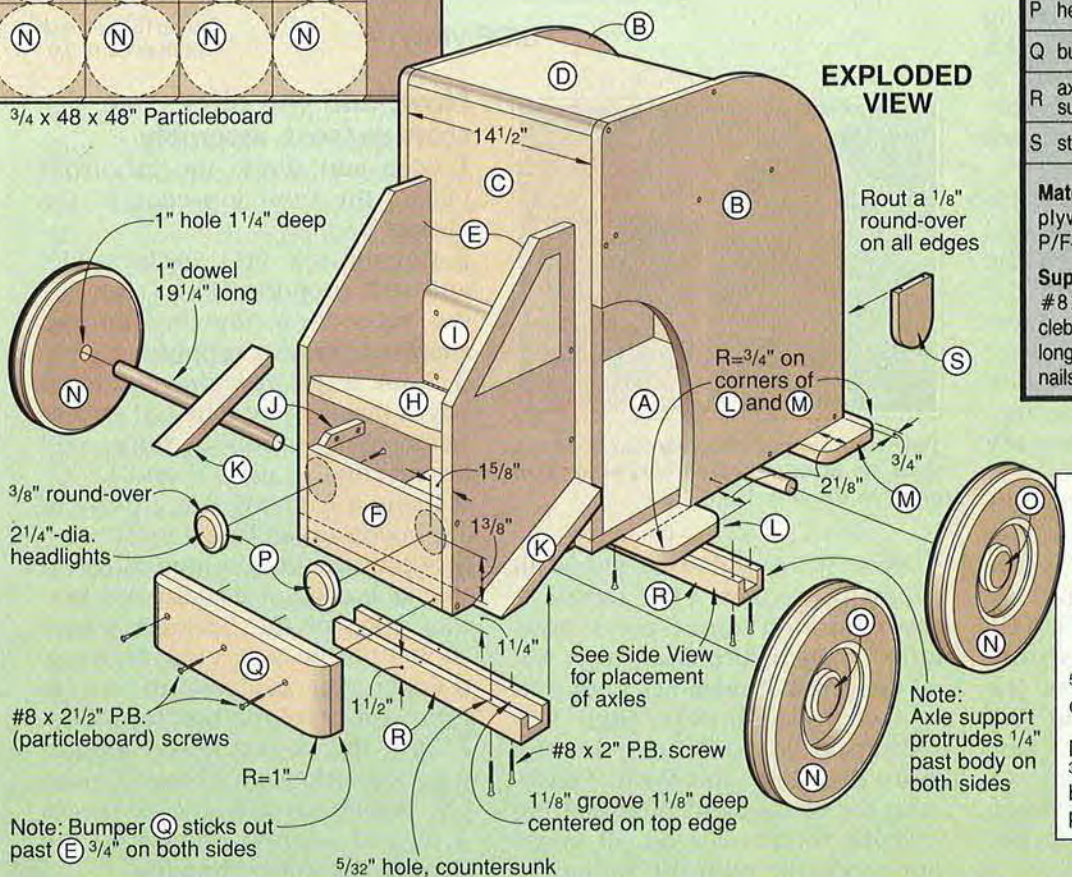
Bill of Materials

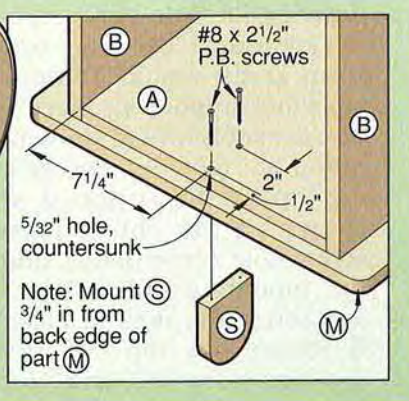
Part	Finished Size T	W	L	Matl.	Qty.
A chassis	3/4"	14 1/2"	34"	P	1
B box sides	3/4"	24"	24"	P	2
C box front	3/4"	14 1/2"	22 1/2"	P	1
D box top	3/4"	11 1/4"	14 1/2"	P	1
E cab sides	3/4"	10"	18"	P	2
F cab front	3/4"	3 7/8"	10 1/2"	P	1
G shelf	3/4"	14 1/2"	16"	P	1
H seat	3/4"	9 3/4"	10 1/4"	P	1
I backrest	3/4"	6 3/8"	10 1/2"	P	1
J supports	3/4"	1"	4"	P	2
K supports	3/4"	2"	9"	P	2
L running-board	3/4"	7"	20 1/4"	P	1
M running-board	3/4"	5 1/2"	20 1/4"	P	1
N wheels	3/4"	10"-dia.		P	12
O hubcaps	3/4"	2 1/2"-dia.		P	4
P headlights	3/4"	2 1/4"-dia.		P	2
Q bumper	1 1/2"	3 1/2"	13 1/2"	LP	1
R axle supports	1 1/2"	3 1/2"	16 1/2"	P/F	2
S stop	3/4"	3"	4"	P	1

Materials Key: P–AA plywood (if available), AB plywood, or Medite, LP–laminated pine, P/F–pine or fir 2×4's

Supplies: #8×1 5/8" particleboard screws, #8×2" particleboard screws, #8×2 1/2" particleboard screws, 1 1/2" continuous hinge 10 1/4" long, 1" birch dowel stock for axles, 4d finish nails, wood putty or filler, primer, and paint.

EXPLODED VIEW





ticleboard or plywood), we used ¾" Medite, a medium-density fiber panel. Medite paints well because it's grainless and free of voids. The edges cut cleanly and require minimal sanding. This material costs about the same as plywood, though it weighs about 20% more. Call 503/779-9596 for the the Medite dealer nearest you.

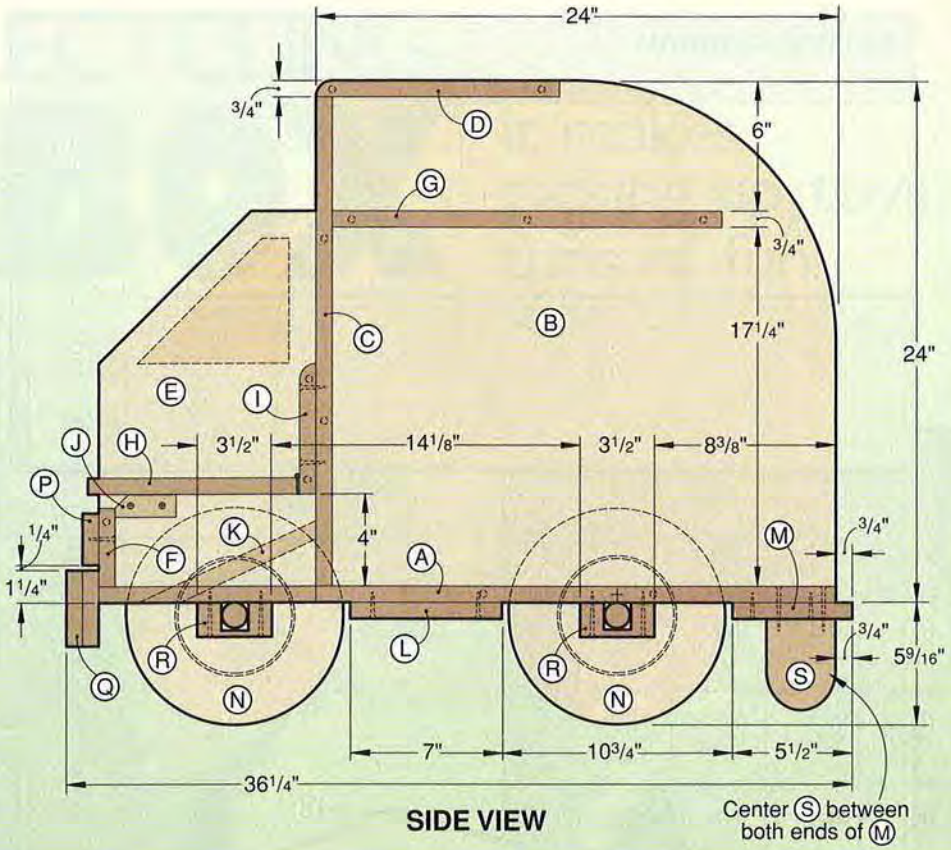
If for safety reasons you prefer that the toy box remains stationary and not roll on the wheels, screw through the box sides (B) and into the inside face of the rear wheels (N).

1 Lay out and mark the outlines for the chassis (A), box sides (B), box front (C), box top (D), cab sides (E), cab front (F), and shelf (G) on ¾" sheet goods. (We used a framing square for the straight lines and trammel points to mark the arcs.) See the dimensions on the Parts View drawing for laying out the chassis (A) and cab sides (E). The radius for the box side is shown on the Carcase Assembly drawing. For minimum waste, see the Cutting Diagram.

2 Glue and screw (we used particleboard screws) the chassis (A) and box front (C), between the sides (B), where shown on the Carcase Assembly and Side View drawings. See the article on *page* ■■ for screw selection information and the Screw Hole detail accompanying the Carcase Assembly drawing for hole size.

3 Cut four 17¼"-long supports from scrap stock. Temporarily tape the supports in place in the box assembly where shown in the photo at *right*. Set the shelf (G) on top of the supports where shown in the photo, mark the screw-hole centerpoints, and drill the mounting holes. Then, glue and screw the shelf in place.

4 Fit the box top (D) between the box sides (B), and glue and screw it in place.



SIDE VIEW

Tape four supports in place to hold the shelf in position when screwing it in place in the box.

5 Rout ⅛" round-overs along all accessible edges. (We found it easier to rout round-overs now, rather than before assembly.) Fill all the screw-head holes with putty (we used Minwax High Performance Wood Filler), let the putty dry, and sand flush. Finish-sand the chassis and box, sanding a slight round-over on all edges not accessible with the router.

Now, add the nifty storage/seat assembly

1 Glue and screw the cab front (F) to the front top edge of the chassis (A).

2 Cut the seat (H), backrest (I), and seat supports (J) to size. See the Parts View drawing for the shape of the seat supports.

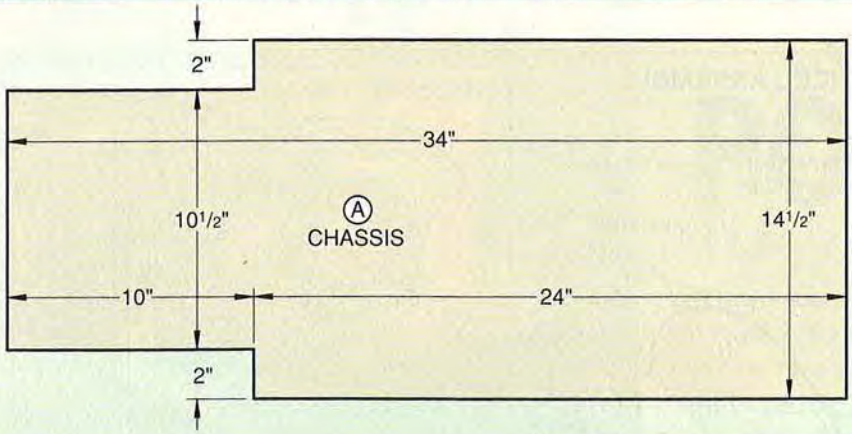
3 Rout a ⅛" round-over on all edges that will be exposed except where the continuous hinge will be attached to parts H and I.

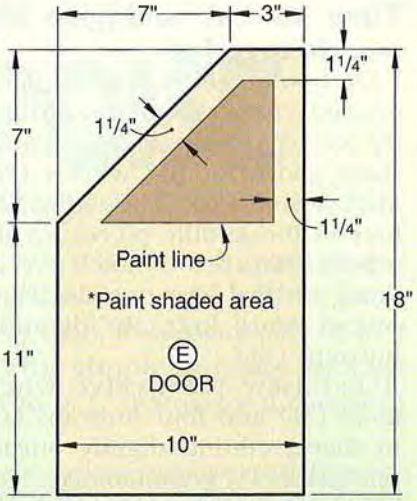
4 Using a hacksaw, cut a piece of 1½" continuous hinge to 10¼".

5 Screw the continuous hinge to the back edge of the seat and bottom edge of the backrest where shown on the Side View drawing.

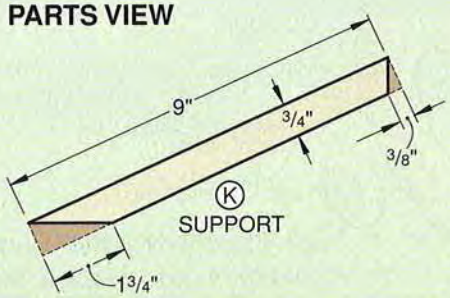
6 Secure the backrest/seat to the front surface of the box front (C).

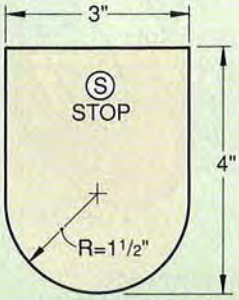
7 Drill the counterbored mounting holes through the cab sides (E). Attach the cab sides to pieces A, F, and I where shown on the Carcase Assembly drawing.

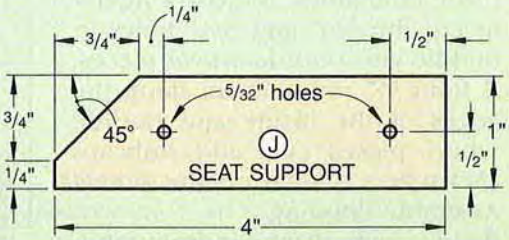




PARTS VIEW







8 Drill the mounting holes, and glue and screw the supports to the inside face of each cab side. The supports keep the seat from falling down directly onto the top edge of the cab front (F) and pinching little fingers.

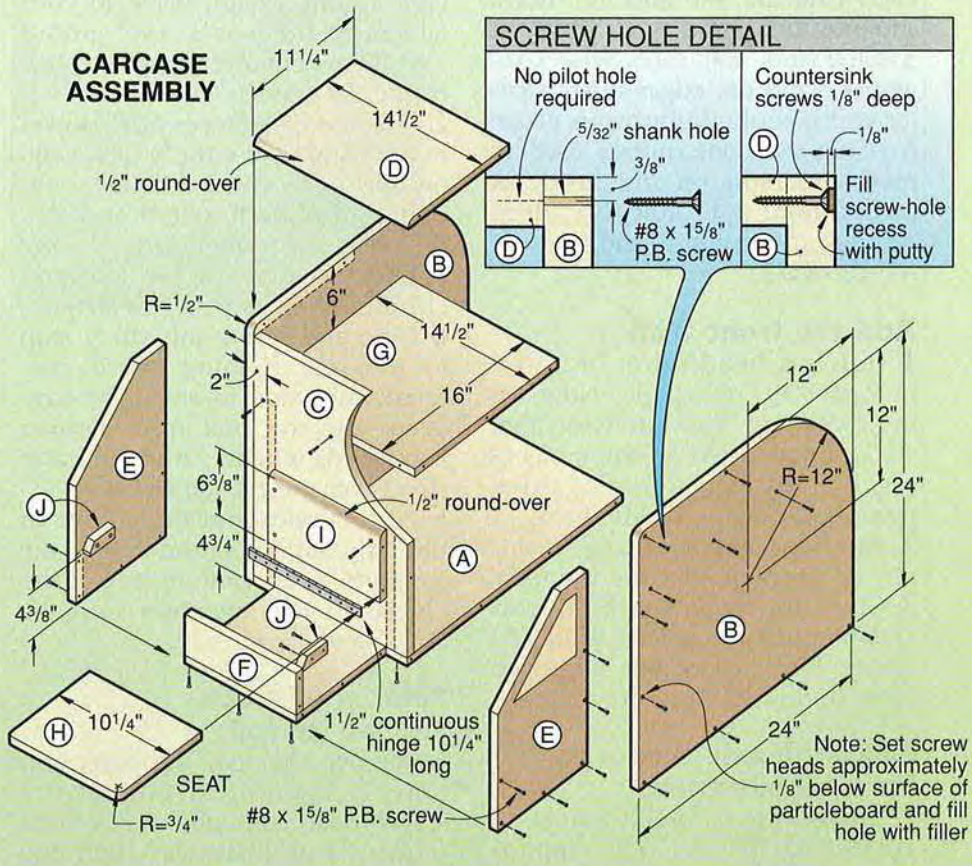
Let's add the wheel supports and running boards

1 Cut the two front-wheel supports (K) and running boards (L, M) to size and shape. See the Parts View drawing to angle-cut the ends of the supports (we did this on the bandsaw) and the Exploded View drawing to lay out the radii on the ends of the running boards.

2 Drill the mounting holes, and glue and screw the running boards to the bottom of the chassis where shown on the Side View drawing. Next, screw the wheel supports (K) in place.

Continued

CARCASE ASSEMBLY



Time to cut and glue the wheels together

1 Using trammel points or a large compass, mark the layout for twelve 10"-diameter circles on the sheet goods for the wheels (N). Mark a 5¼" hole (2⅝" radius) on four of the middle pieces for the wheels. Mark a 5½" hole (2¾" radius) on the four outside wheel pieces. Mark four 2½"-diameter hubcaps (O).

2 Bandsaw the twelve wheel discs (N) and four hubcaps (O) to shape, cutting slightly outside the marked circumference. Drill blade start holes, and use a jigsaw to cut the 5¼" and 5½" holes in middle and outside wheel pieces.

3 Rout ½" round-overs along the edges of the inside and outside wheel pieces (O) and hubcaps (N) where shown on the Wheel Assembly drawing.

4 Use a large-diameter drum sander to sand the 5¼" and 5½" holes smooth and round.

5 Glue and nail each wheel together. Sand the edges flush. Center and glue the hubcaps in place.

6 Using the centerpoints used to mark the radii on the inside N pieces, bore a 1" hole 1¼" deep through the inside N and into the hubcap (O).

Add the front trim

1 Cut the headlights (P) and bumper (Q) to shape. Note on the Exploded View drawing that we laminated two ¾"-thick pieces together to form the 1½"-thick bumper. Rout the headlights

2 Bandsaw and sand a 1" radius on the front ends of the bumper.

3 Glue and screw the headlights and bumper to the cab front (F) where located on the Exploded View and Side View drawings.

Make the axle supports for a mobile truck

1 Cut two pieces of 2×4 stock to 16½" long for the axle supports (R). Mount a dado blade to your tablesaw, and cut a 1⅛" groove 1⅛" deep centered along one face of the 2×4 stock.

2 Crosscut two pieces of 1" dowel to 19¼" long for the axles. Glue or epoxy a wheel (N, O) onto each end of each axle dowel.

3 Using the dimensions on the Parts View drawing, lay out and cut the safety stop (S) to shape.

4 Glue and screw the safety stop to the rear running board centered from side to side. The stop keeps the toy box from tipping backwards when a child (or two) stands on the rear of the box.

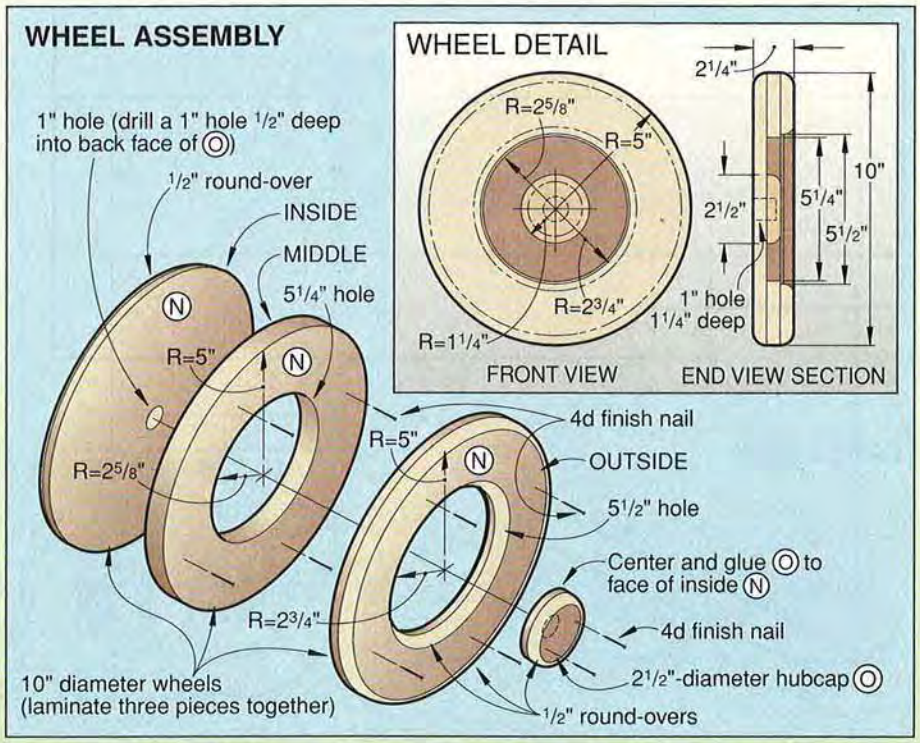
5 Fit the axles into the groove in the axle supports, and screw the supports to the bottom side of the chassis (A) where shown on the Side View.

Paint your truck and let 'er roll

1 Remove the axle supports and wheel assemblies. Fill all the screw head and nail holes with putty (we used Minwax High Performance Wood Filler). Finish-sand the entire assembly, sanding a slight round-over on all edges.

2 To paint the toy box, remove or mask the continuous hinge. Prime all the parts (we used a gloss spray enamel). Mask the mating areas and paint as desired or use our combination as shown in the opening photo.

3 Reattach the wheel assemblies. Attach the recycle and name logos. See the Buying Guide for our source of self-adhesive logos.



Buying Guide

• **Self-adhesive vinyl decals.** Two recycle symbols (see intro photo for reference), two *Recycle Now* logos, plus two letterings of a child's first name (up to 12 characters per name). $19.95 ppd. Kness Signs, 5291 NW. 72 Street, Johnston, IA 50131. No phone orders please.

Produced by Marlen Kemmet
Project Design: James R. Downing; Aaron Shaw
Photographs: John Hetherington; Wm. Hopkins
Illustrations: Kim Downing; Brian Jensen

PROJECTS WITH PORPOISE

They're a shore thing

With your time at such a premium, sometimes it's nice to head into the shop and build a project or two (or, in this case, four projects) in just an evening or two. This simple-to-make desk set fits that description to a T, featuring a pleasing nautical theme.

***Note:** You'll need some thin stock for these four projects. You can resaw and sand or plane thicker stock to the thicknesses listed on the drawings.*

First, launch the lidded box

Print this article

Start with the base for the lidded box

1 From ½" cherry, rip a piece to 1¾" wide by 24" long for the box front, back, and sides.

2 Cut or rout a ⅛" groove ¼" deep and ⅛" from the bottom edge along the length of the ½×1¾×24" cherry stock. (We cut ours on the tablesaw.) See the Lidded Box drawing for reference.

3 Miter-cut the box front, back, and sides to the lengths listed on the Lidded Box drawing.

4 From ⅛" stock, cut the box bottom to size. Finish-sand the base pieces; they're easier to sand now than when assembled.

5 Dry-clamp the base pieces to check the fit. The base bottom should be slightly undersized to allow for expansion. Then, glue and clamp the base pieces, checking for square. Position (but don't glue) the bottom in the groove.

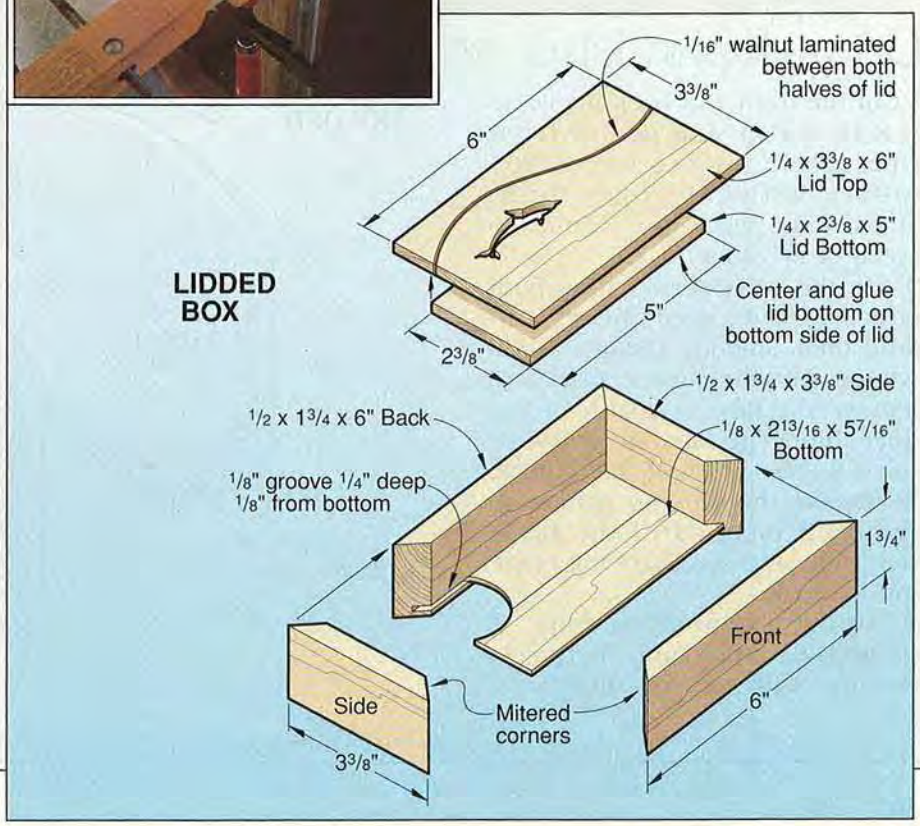
Next, add the decorative lid

1 To form the lid top blank, cut a piece of ¼" cherry to 4×6½" long. Using carbon paper or a photocopy and spray adhesive, transfer the dolphin and wave patterns to the lid top blank.

2 Bandsaw the lid top in two, cutting through the wave line.

3 Cut a strip of walnut that measures 1/16× 5/16×7". Glue the strip between the lid top halves as shown in the photo at *left*. Keep the ends of the two pieces of cherry aligned. (We placed the laminated lid top on a piece of waxed paper which, in turn, rested on a piece of plywood. The

Continued


LIDDED BOX
1/16" walnut laminated between both halves of lid
3 3/8"
6"
1/4 x 3 3/8 x 6" Lid Top
1/4 x 2 3/8 x 5" Lid Bottom
Center and glue lid bottom on bottom side of lid
5"
2 3/8"
1/2 x 1 3/4 x 3 3/8" Side
1/2 x 1 3/4 x 6" Back
1/8 x 2 13/16 x 5 7/16" Bottom
1/8" groove 1/4" deep 1/8" from bottom
1 3/4"
Front
Side
Mitered corners
6"
3 3/8"

Continuation from lidded box

waxed paper kept the pieces from adhering to the plywood, and the plywood allowed us to clamp the lid pieces flat.)

4 After the glue dries, remove the clamps, and trim the ends of the walnut flush with the cherry.

5 Drill a blade start hole, and scrollsaw the dolphin-shaped opening to shape. Remove the paper pattern. Sand the walnut strip flush with the top and bottom of the cherry lid pieces.

6 Measure the length and width of the assembled box base, and cut the lid to the same exact size.

7 Cut the lid bottom to fit snugly inside the base, allowing just enough of a gap to allow the lid to lift off easily. Now, position the lid top facedown on a flat surface, and lay the lid bottom on top of it. Position the box base, also upside down, on the lid and lid bottom, flushing the box with the outside edges of the lid. Slowly lift the base off the lid and trace around the lid bottom to locate it on the lid. Then, glue and clamp the lid bottom to the bottom surface of the lid top where marked, keeping the adhesive about ½" from the dolphin opening.

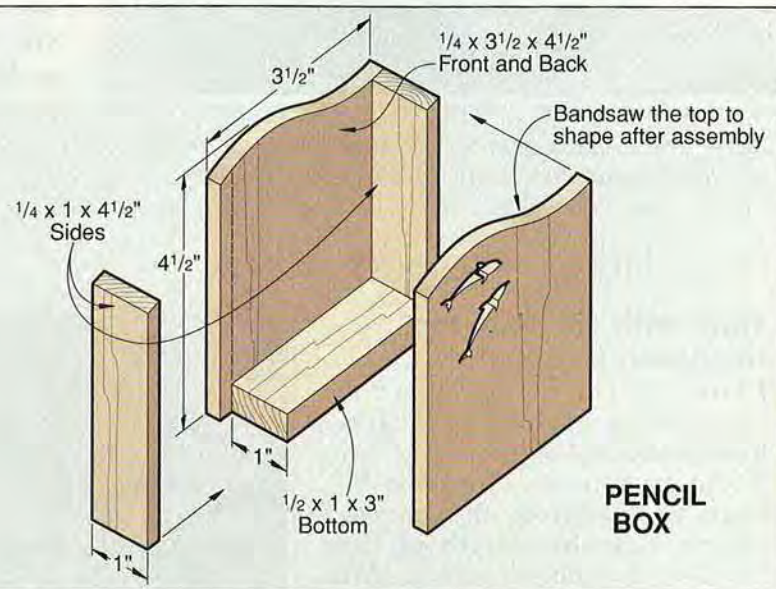
Make a fishy pencil box

1 Cut the pencil box front, back, sides, and bottom to the sizes listed on the Box drawing.

2 Dry-clamp the pieces together to check the fit.

3 Transfer the wave line and dolphin openings to the front piece. Drill a blade start hole and cut the dolphin openings to shape.

4 Glue and clamp the box together. Later, remove the clamps and bandsaw the top edge of the box to shape. Drum-sand the top of the box to remove any saw marks. Sand the pencil box smooth.



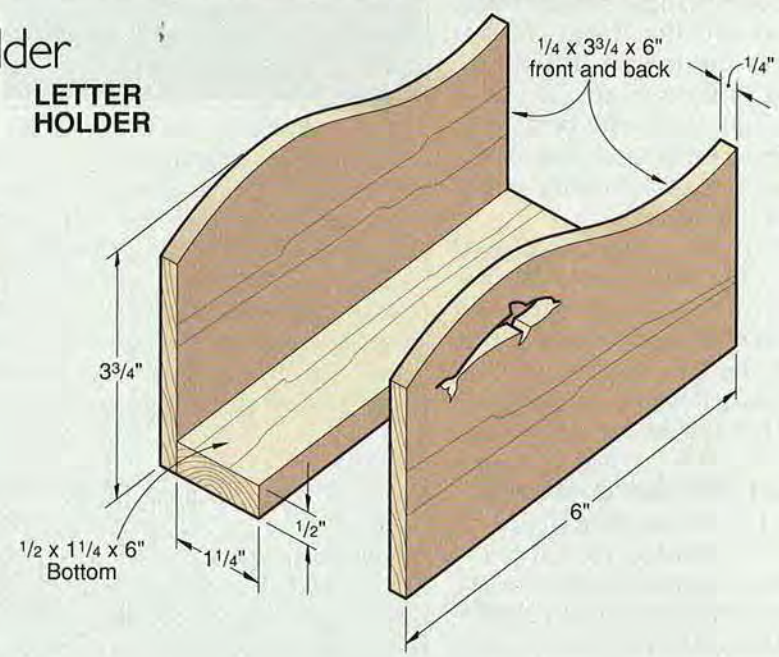
Do a dolphin letter holder

1 Cut the front and back blanks to ¼ × 3¾ × 6". Using double-faced tape, adhere the two pieces face-to-face with the edges flush. Transfer the wave line to the top piece of ¼" stock.

2 Cut the wave shape along both edges of the taped pieces and sand them smooth. Using a wood wedge, pry the pieces apart and remove the tape. A splash of lacquer thinner or acetone will dissolve stubborn double-faced tape.

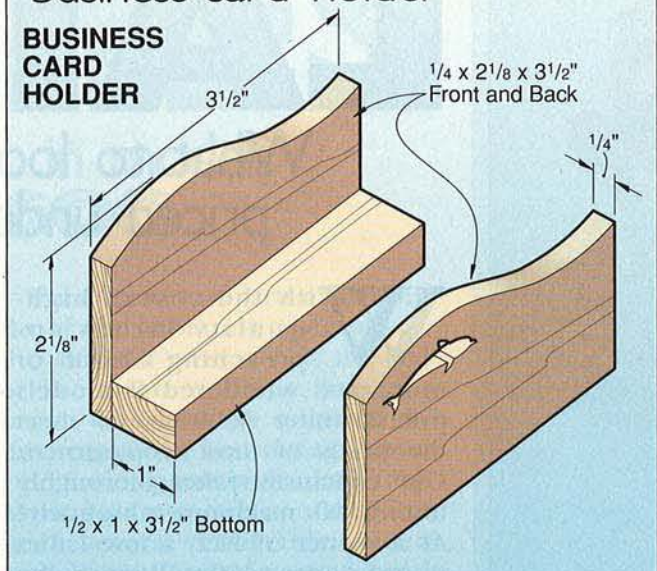
3 Transfer the dolphin pattern to the front piece, drill the blade start hole, and scrollsaw the opening to shape.

4 Cut the bottom to size from ½" stock. Glue and clamp the pieces together with the ends flush.



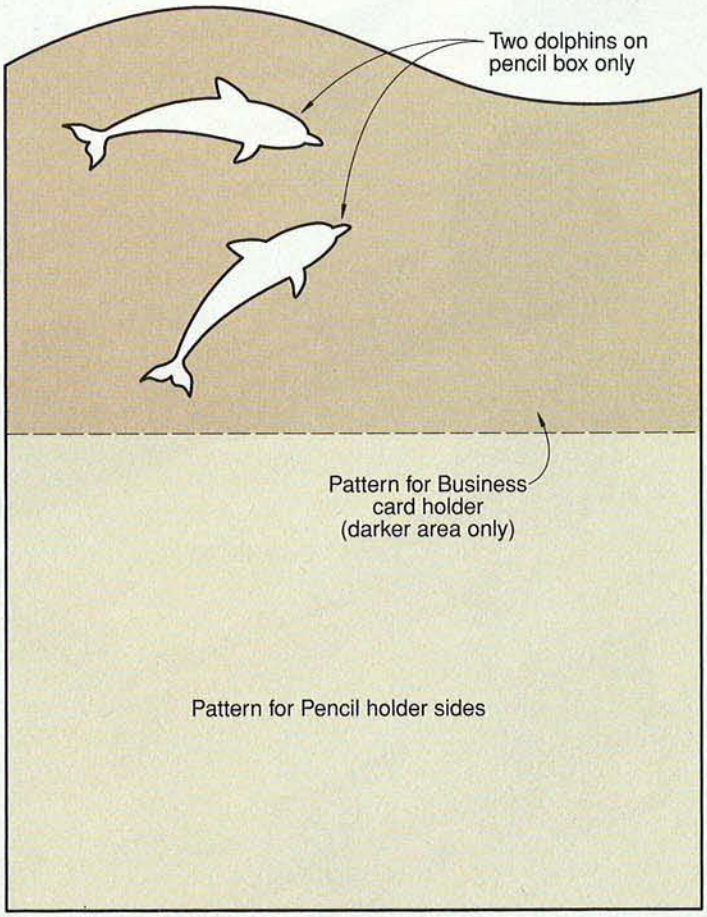
Produced by Marlen Kemmet Project Designs: Alan Bradstreet, N. Pownal, Maine

Dive into the business-card holder

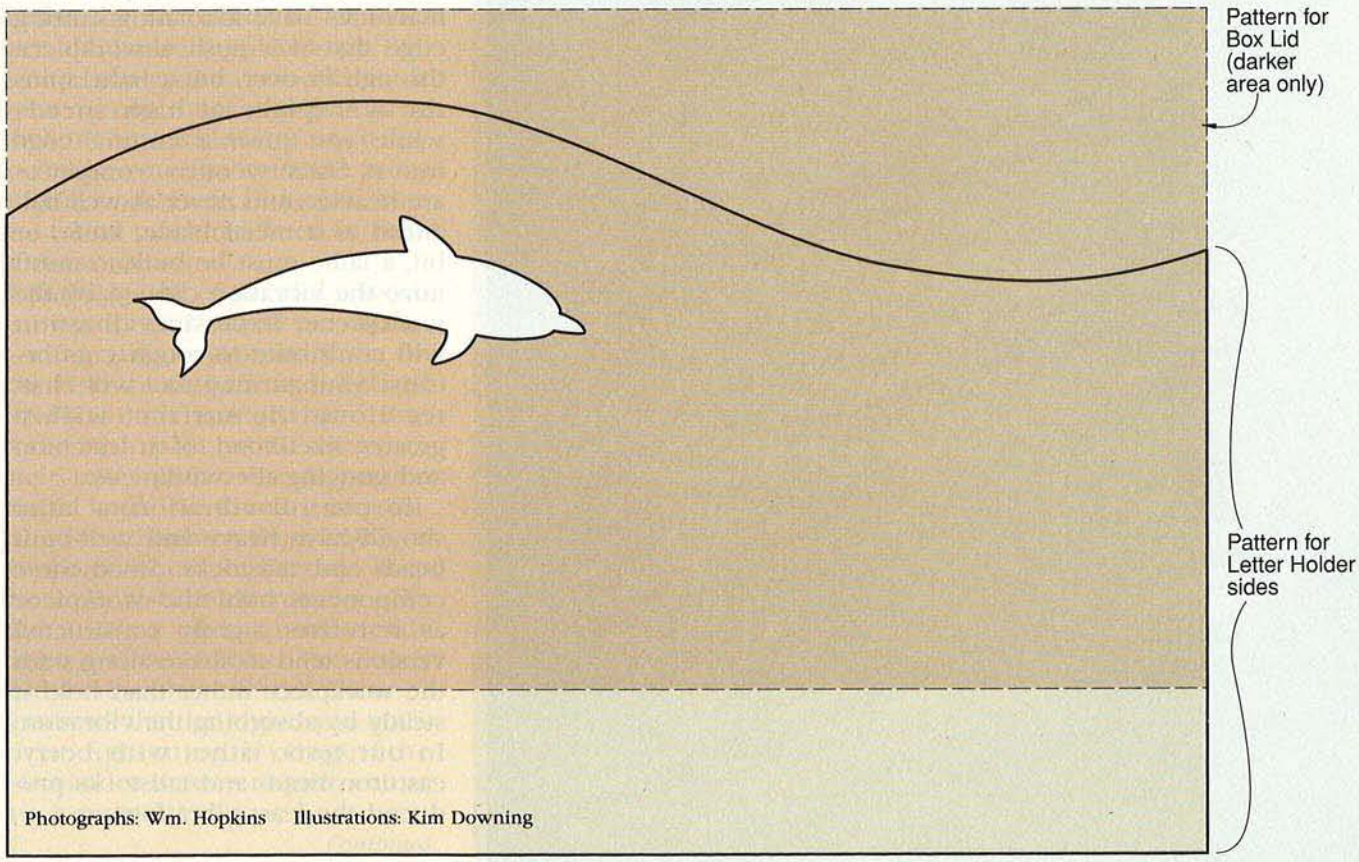


Using the dimensions on the Business-Card Holder drawing and the how-to instructions for the letter holder, cut the pieces and assemble the card holder.

Finish-sand all four items. Apply a clear finish (we used Deft aerosol lacquer).



FULL-SIZED PATTERNS



Photographs: Wm. Hopkins Illustrations: Kim Downing

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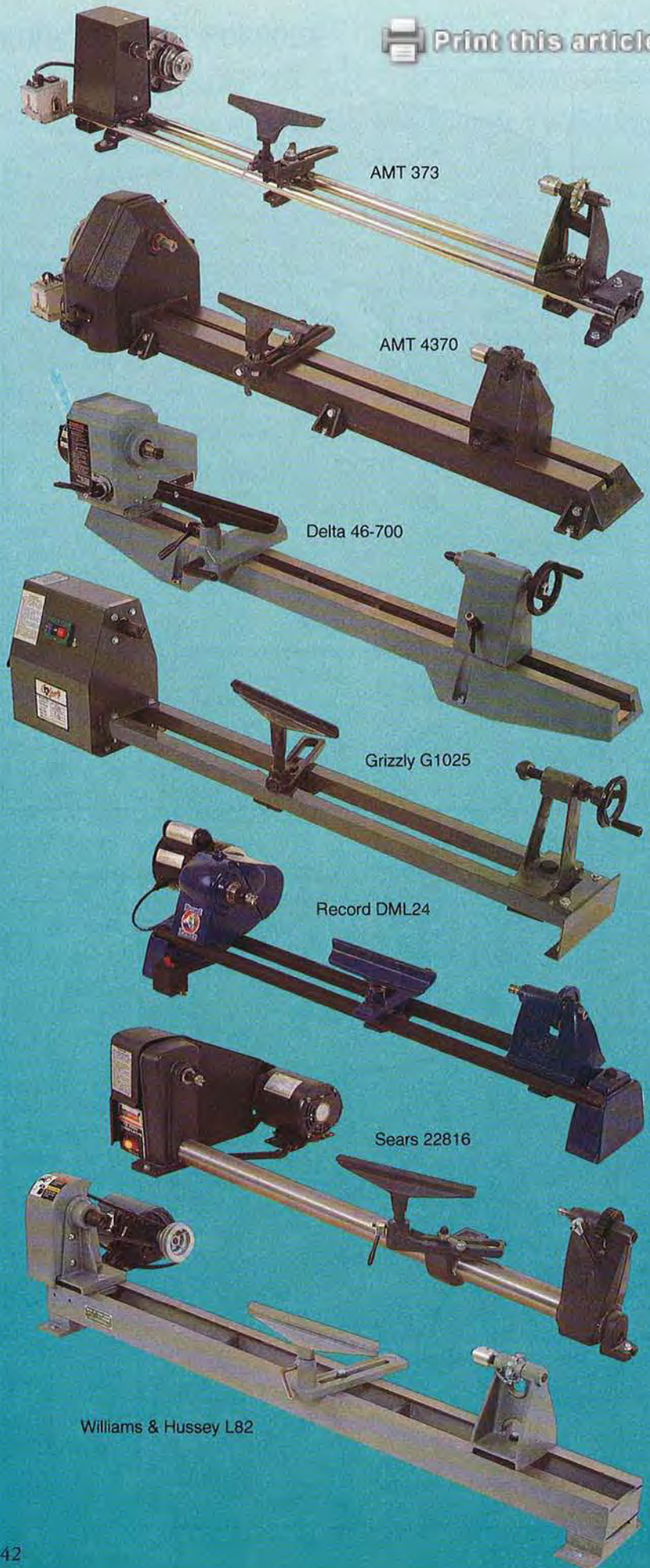

LOW LAT

What to look priced under

With the cost of high-quality lathes approaching $2,000 or more, we wondered if models priced under $600 would meet the needs of most woodturners. Our conclusion after thoroughly testing 10 machines: absolutely! As a matter of fact, a few lathes priced under $300 will satisfy the majority of beginning and intermediate woodturners. Here's what we discovered.

Lack of vibration: key to smooth cuts

Lathes work in an opposite fashion from other woodworking machines in your shop. Most machines have a rotating cutting edge that you push a workpiece through or over, but a lathe spins the workpiece at high speeds while you push a cutting edge into it. Since wooden workpieces are heavier, and never as well balanced as a metal blade, knife, or bit, a lathe must be built to minimize the vibration created by the workpiece. Excessive vibration will contribute to rough cuts because your turning tool will chatter along the surface, with a greater likelihood of it catching and gouging the workpiece.

To control vibration, a lathe should have heavy and well-built head- and tailstocks. Since these components hold the workpiece as it rotates, lightly constructed versions tend to shake along with the workpiece rather than hold it steady by absorbing the vibration. In our tests, lathes with beefy, cast-iron head- and tailstocks produced the least vibration.

COST HES

for in models $600

Since these two parts absorb little of the vibration themselves, they transfer most of it to the bed of the lathe, and the stand or bench that the lathe rests on. For this reason, the bed needs to provide firm support without flexing. Although we prefer cast-iron beds, several reasonably priced models with tubular or formed steel beds achieved a "good" rating in the vibration category in the chart on *page 47*.

What you need to know about tool rests

As you turn wood, you constantly slide your index finger back and forth along the tool rest. This means the rest needs to be comfortable. It also should have a flat-ground top edge to smoothly slide your turning tool along. And it should be stable and securely locked in place so it doesn't move as you work. Here's a look at how the tested machines fared in both of these areas.

- ***Stability:*** All of the tool rests on our test models stayed put during turning tasks except for those on the Grizzly G1025 and Reliant NN100. Both models have tool rests with posts that secure to their bases with a hand-operated plastic knob. We found it impossible to hand-tighten these knobs to the point where they would keep the tool rests from rotating. We had to use a pliers to sufficiently tighten these knobs. The other tested lathes have levers, bolts, or setscrews that help give you sufficient tightening leverage (the bolts and setscrews require you to use a wrench).

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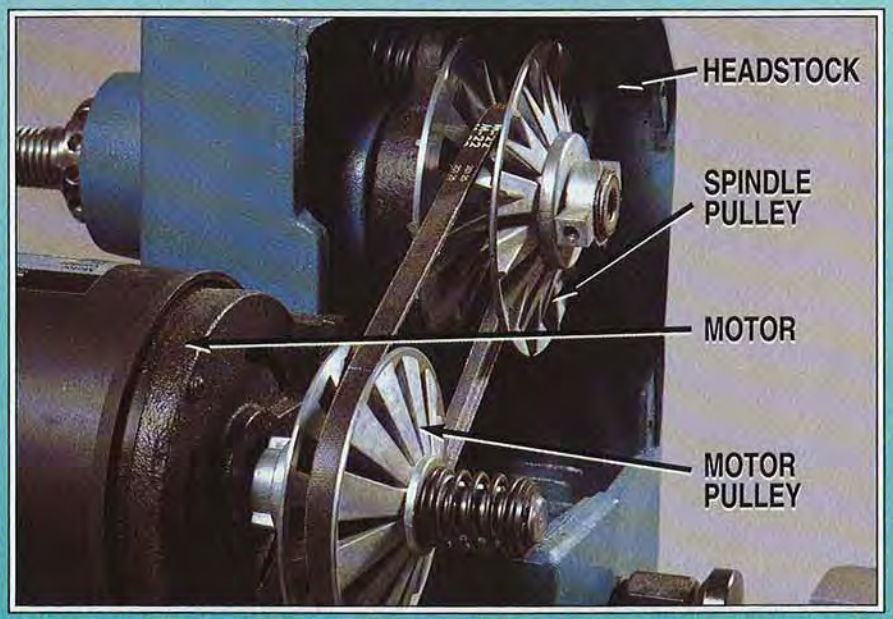
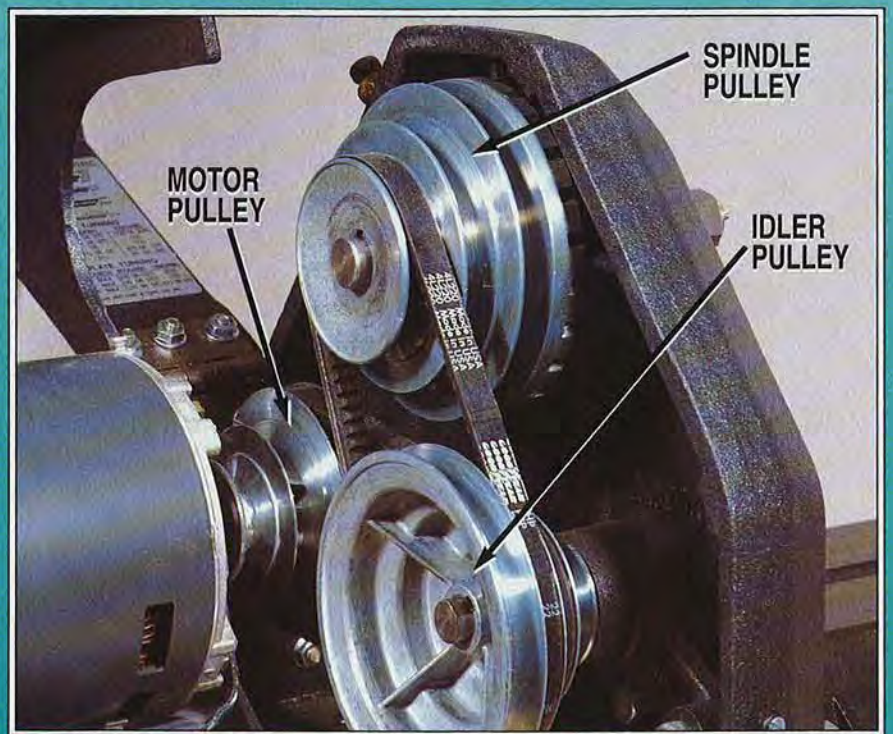
We prefer tool rests like the Sears version *(left)* that has a long, flat, smoothly ground top edge and a finger groove just below this edge for guiding the tool. The Reliant tool rest *(right)* lacks these qualities.



The Delta 46-700 and Jet JWL-1236 (shown here) have spring-loaded, variable-speed pulleys that change diameters as you turn a lever on the headstock.



The AMT 4370 has an idler pulley *(in foreground)* that gives you a low bottom-end speed (275 rpm), but makes belt changes a hassle.

LATHES

• ***Comfort:*** A rough, cast-iron surface with little paint on it will quickly irritate your skin as you pass your finger across it. Of the tested machines, the Delta, Record, and Williams & Hussey models had tool rests with smooth, nonirritating surfaces.

All ten of the tested lathes had tool rests that we deem acceptable for the occasional user except for the Reliant version, which earned the only "poor" rating. As you can see in the photo *left*, this rest has a rough surface and lacks a finger groove. We raised this point with Mr. Paul Blacker of Reliant, who said he would ask his supplier to change the design immediately.

• ***Smoothness of the top edge:*** The top of a tool rest should be milled straight and smooth. Of the tool rests that passed our comfort standards, only the Record tool rest failed in this area. However, this problem can be quickly corrected by simply grinding or filing the edge yourself.

Changing speeds: How slow can they go?

Both the Delta and Jet lathes allow you to change speeds "on the fly" by simply rotating a lever while the lathe runs. Both machines use a system with two pulleys that adjust in size as shown on the Jet *left*. To change speed, you turn a lever that opens or closes the spindle pulley. As this pulley opens, the spring-loaded motor pulley automatically closes, and vice versa. Opening the spindle pulley increases the speed, and closing it lowers the speed.

We found that this feature contributed to our enjoyment level because we didn't have to fiddle with changing belts between pulley steps. Except for the AMT 4370, the other lathes have two pulleys with three or four steps (that give you a choice of three or four speeds). We found that three speeds were sufficient for nearly any turning task.

The AMT 4370 has three pulleys (one on the spindle, one on the

motor, and an idler pulley between them as shown *previous page*). We found no need for the many speeds that this system affords you, and changing two belts was a hassle. On the other hand, because of three pulleys the machine will turn as slow as 275 rpm. We found this low speed handy only for boring with large drill bits.

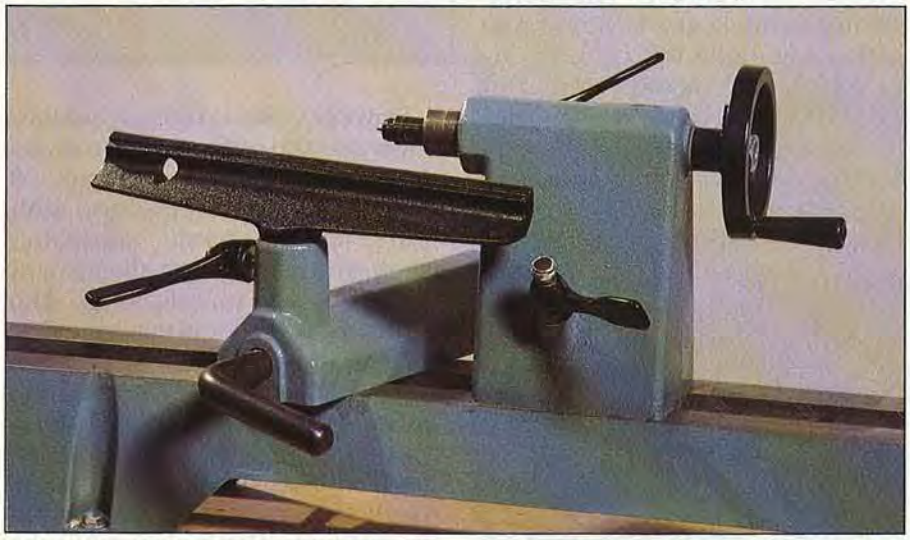
As you can see in the chart on *page 47*, the Jet, Delta, and Record lathes have low-end speeds in the 500–550 rpm range. Except for the AMT 4370, the other lathes turn no slower than 800 rpm. We found the 500–550 rpm speeds handy for rough-turning large, out-of-round workpieces.

Locking handles give you hassle-free control

No matter what you turn, you'll need to frequently change the position of the tool rest and lock it into place. When turning between centers, you also need to adjust and lock the tailstock. With most of the machines in our test, you need to use one or more wrenches to make these adjustments as shown *below*.

However, the AMT, Delta, Jet, and Sears models feature hand-operated levers that greatly simplify adjustments. Of these machines, the Delta levers (see photo *bottom*) were the most comfortable and effective. The Jet levers run a close second.

Continued



The Record lathe *(top)* requires you to use a wrench to adjust the tailstock or tool-rest base. On the Delta 46-700, large, comfortable levers make quick and easy work of all frequently performed adjustments.

Swiveling headstock: Nice, if you need it

Both the Delta and Jet lathes have headstocks that turn 90° for convenient outboard turning as shown *below*. This allows you to turn platters, chair seats, and other projects with diameters too large to fit over the bed of the lathe. Delta recommends you turn workpieces no larger than 16″ in diameter in this application, and to us that size limitation seems about right for both models. Since you can turn 12″-diameter workpieces over the bed of both lathes, this feature gains you 4″ of swing.

Pivoting headstocks make outboard turning a snap. *Above* is the Delta 46-700 with an optional tool-rest base extension and a curved tool rest.

If you think you'll use this feature, keep two things in mind. First, we found the Jet headstock easier to pivot because you simply unlock a lever, pull a stop pin, swivel the head until the stop pin drops, and then relock the lever.

With the Delta, you need to loosen a large capscrew beneath the headstock. We found it difficult to get an Allen wrench on this screw, and then turn it, because of the capscrew's location. After loosening the capscrew, you lift the head over a stop notch, reposition the head, and retighten the capscrew.

Also, the Jet lathe costs about $160 more than the Delta, but it comes with a stand and the tool-rest base extension necessary for many outboard-turning projects.

LATHES

Fit and finish: what it means

In the chart *right,* we give the machines a rating for fit and finish. Let's take a closer look at each of these concerns.

- ***Fit*** refers to how well a machine's parts mate together, and this directly affects its performance. Generally speaking, higher-priced lathes have tool rests and tail stocks that mate better to the bed for a solid grip when locked. These well-machined components also slide along the bed without catching or binding.
- ***Finish*** relates to the smoothness and appearance of parts. Manufacturers gain a better finish through means such as grinding, buffing, and painting. Although largely cosmetic, a lathe's finish also can affect its performance (see earlier information under *What you need to know about tool rests*).

The example *below* of similar-appearing tailstocks illustrates what your extra dollars buy in terms of fit and finish. The tailstock on the *left* side of the photo belongs to the AMT model 373 ($95 without motor). The other tailstock is from the Williams & Hussey L82 ($498 without motor). Both tailstocks function similarly with a captured wheel for adjusting the tailstock center in and out. Little finishing was done to the AMT components after they came out of the casting mold. But, the W & H tailstock has been ground, and painted with a heavy coat of durable paint.

The W & H handwheel was ground and buffed smooth for comfort. AMT's thin, rough wheel was not comfortable to turn by hand. The threaded spindle on the Williams & Hussey moved with greater ease and smoothness than the AMT spindle. So, although both of these tailstocks will help you get the job done, the one with better fit and finish works better, and will last longer.

More points to consider

- **Ease of assembly.** The chart *right* rates the machines according to the length of time and difficulty of required assembly. Only the Delta was completely assembled and ready to go straight out of its box. The Grizzly G1174 was the most time-consuming because of the many parts required for its copying attachment (which we could not make work after considerable tinkering). The Reliant was the only model that arrived without assembly instructions.
- **Accessories.** When you buy a lathe, you're also buying the availability of optional accessories offered by the manufacturer. Of the manufacturers represented here, Delta and Record offer the most complete line of accessories.
- **Centers, live and dead.** We consider a live tailstock center a must-have accessory. These centers have bearings that allow the point of the center to spin along with the workpiece. The Delta, Record, and Sears lathes come with dead tailstock centers, although all three manufacturers offer optional live centers. Dead centers do not spin, so the friction of the workpiece spinning against the point of the center causes the end of the workpiece to burn.

MANUFACTURER/ IMPORTER	MODEL	CAPACITY (INCHES) BETWEEN CENTERS	SWING OVER BED	SWING OVER TOOL REST	PIVOTING HEAD (Y, N)	SPINDLE THREAD (1)	
AMT	373	39 1/2	12 1/2	8	N	3/4" 16 tpi	
	4370	36	12	8	N	3/4" 16 tpi	
DELTA	46-700	36 3/4	12	8	Y	1" 8 tpi	
GRIZZLY	G1025	38	15	13	N	1" 8 tpi	
	G1174	39 1/2	14	10	N	1 1/8" 12 tpi	
JET	JWL-1236	33 3/4	12	8 1/2	Y	1" 8 tpi	
RECORD	DML24	25 1/2	9 1/4	6	N	3/4" 16 tpi	
RELIANT	NN100	40	13 3/4	11 3/4	N	3/4" 10 tpi	
SEARS	22816	37	12	8	N	3/4" 16 tpi	
WILLIAMS & HUSSEY	L82	46	12	10 1/2	N	*	

NOTES:

1. Diameter of spindle and number of threads per inch.
   (*) Williams and Hussey attachments have set screws, so they do not have threads or tapers.
2. (CI) Cast iron
   (FS) Formed steel
   (MS) Milled steel C channel
   (ST) Single steel tube
   (TT) Twin steel tubes
3. (*) With optional motor supplied by lathe manufacturer or importer.

Extra dollars buy you a better fit and finish on similar-looking tailstocks from AMT (*left*) and Williams & Hussey.

However, these three machines were also the only models that accept Morse-taper accessories in their tailstocks. Accessories with Morse tapers change easily because you simply tap the end of the accessory to release it. The Williams & Hussey machine has accessories that attach with a setscrew; this unique feature requires you to purchase W & H accessories only. All of the other machines in our test have permanently mounted live centers on the tailstock. That's okay, until the bearing wears out. Then, you'll need to replace it.

10 LATHES: LET'S LAY IT ON THE LINE

	CONSTRUCTION MATERIALS (2)		SPEED CONTROL				PERFORMANCE EVALUATION (4)				OVERALL RATINGS (5)		ACCESSORIES (6)		WARRANTY (7)					
HEADSTOCK MORSE TAPER NUMBER	BED	HEAD/TAIL	TYPE	RANGE (RPM)	HORSEPOWER (3)	INDEX (Y, N)	EASE OF ASSEMBLY	VIBRATION	FIT/FINISH	TOOL REST	PERFORMANCE	VALUE	STANDARD	OPTIONAL	LATHE	MOTOR	WEIGHT WITH MOTOR (POUNDS)	COUNTRY OF ORIGIN (8)	PRICE WITHOUT MOTOR (9)	PRICE WITH MOTOR AND SWITCH (9)
--	TT	HEAD FS TAIL CI	3-STEP PULLEY	860-3,450	1/2*	N	F	F	F	F	5	6	LC, SP	CR, DC, FP, 3JC, 4JC, LT, MT, TA	10 years	1 year*	40	T	$ 95*	$160*
--	CI	CI	3-STEP PULLEY	275-3,065	1/2*	Y	F	G	F	F	6	6	LC, SP	CR, DC, FP, GB, 3JC, 4JC, LT, MT, TA	10 years	1 year*	110	T	246*	311*
2	CI	CI	VARIABLE LEVER	500-2,000	3/4	N	E	E	E	E	9	10	DE, FP, SP	*	2 years	2 years	125	U	NA	420
--	TT	HEAD FS TAIL CI	4-STEP PULLEY	850-2,510	1/2	N	G	F	F	F	5	6	FP, LC, SP	FP, 3JC, 4JC	90 days	1 year	70	T	NA	155*
--	FS	CI	3-STEP PULLEY	860-3,096	1/2	N	P	G	F	G	6	6	FL, FP, LC, PD, SC, SD, SP, ST	FP, 3JC, 4JC	90 days	1 year	180	T	NA	395*
2	CI	CI	VARIABLE LEVER	550-3,000	3/4	N	F	E	G	G	9	8	FP, FS, LC, LS, OT, TK	--	2 years	2 years	183	T	NA	580
1	TT	CI	3-STEP PULLEY	540-2,400	1/3	N	G	G	G	F	8	8	DE, SP	*	1 year	1 year	110	E	NA	300
--	TT	HEAD FS TAIL CI	4-STEP PULLEY	850-2,620	1/2	N	F	F	F	P	5	5	FP, LC, LS, SP	DC, 4JC, LT	1 year	1 year	71	T	NA	200*
1	ST	CI	4-STEP PULLEY	875-3,450	1/2	Y	F	G	G	G	8	9	DE, LT, SP	CR, DC, FP, 4JC, LC, LD, SCR, ST, WA	1 year	1 year	84	T	NA	240
--	MS	CI	4-STEP PULLEY	800-3,750	1/2*	OPTIONAL	G	G	E	E	9	7	FP, IB, LC, SP	CC, DC, DE, FP, IA, LC, LD, LS, PD, SD, WA	10 years	1 year	102	U	498*	598*

4. E Excellent
   G Good
   F Fair
   P Poor
5. Machines rated on a 1-10 scale, with 10 being the highest possible score. Performance rating does not take price into account. Value rating takes price and performance into consideration.
6. (*) Manufacturer carries a full line of accessories, with too many items to mention here.
   (CC) Combination chuck
   (CR) Curved tool rest
   (DC) Drill chuck
   (DE) Dead cup center
   (FL) Flap sander
   (FP) Faceplate
   (FS) Face shield
   (GB) Gap bed attachment
   (IA) Indexing attachment
   (IB) Instructional book
   (3JC) 3-jaw chuck
   (4JC) 4-jaw chuck
   (LC) Live cup center
   (LD) Lathe duplicator
   (LS) Lathe stand
   (LT) Long tool rest
   (MT) Morse taper adaptor - No. 1 Morse taper to 3/4", 16 tpi
   (OT) Outboard turning arm
   (PD) Pneumatic sanding drum
   (SC) Stub chisel set (for duplicating)
   (SCR) Screw center
   (SD) Sanding disc
   (SP) Spur drive center
   (ST) Sanding table
   (TA) Thread adaptor - 3/4", 16 tpi to 1/2", 20 tpi
   (TK) Tooling knockout
   (WA) Work arbor
7. (*) Motor warranty applies to optional motor supplied by manufacturer/importer.
8. (E) England
   (T) Taiwan
   (U) United States
9. (*) Price does not include shipping. Prices based on advertisements and catalogs at time of article's production

• **Indexing.** Only the AMT 4310 and Sears lathes allow you to lock the headstock spindle at equally spaced positions (12 o'clock, 3 o'clock, etc.). With a router fixed over the workpiece, you can do such things as rout flutes or mortises into spindles.

• **Belts.** All of the machines in our test, except the Record and Grizzly G1025, use standard V belts to drive the headstock. The former has a flat, grooved belt, and the Grizzly has a round belt. These belts work fine, but you'll probably have to rely on the lathe manufacturer for a replacement.

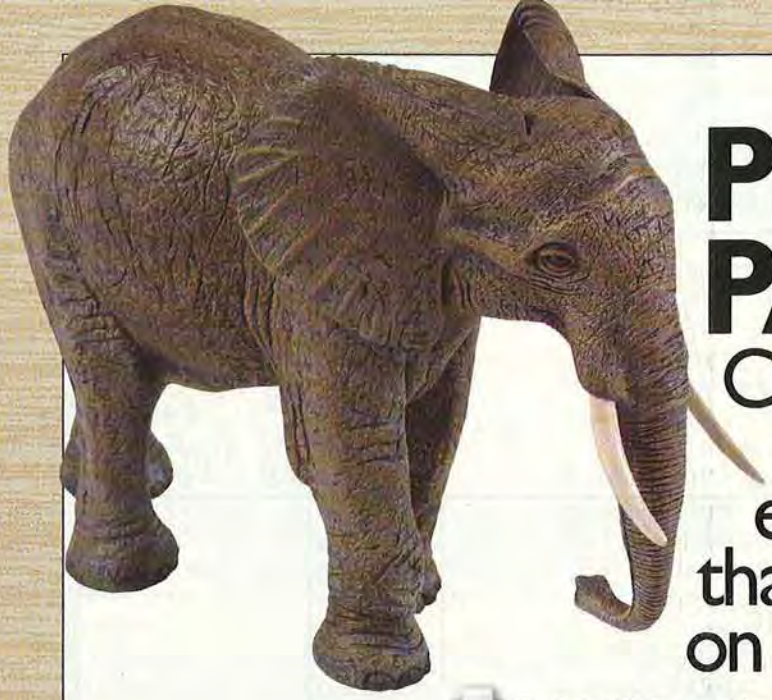
Our recommendations

For most tool buymanship articles, we have a hard time recommending one tool over other nearly equal models. Not this time! The Delta 46-700 emerged from this test as a clear winner because of its well-thought-out design, quality construction, excellent performance and features, and attractive price tag.

If you want to spend a little less, take a look at the Sears 22816 or the Record DML 24. We were initially leery about the Sears monotube bed, but we found it solid and stable. The Record has limited capacity, but it also has quality construction and performs well.

For outboard turning, the Jet offers the best such system in a lathe priced under $600. If you want to spend as little as possible, and plan to use a lathe only occasionally, buy the Grizzly G1025 or AMT 373 (an especially good deal if you already have an extra motor lying around).

Written by Bill Krier Technical consultant: George Granseth
Photographs: John Hetherington



PERFECT PACHYDERM

Carve a small elephant that's big on realism

Print this article

Bob Crumley carves exotic animals so lifelike that you expect them to herd up and wander away. Here's how to carve one of Bob's favorites, an African elephant. His tips on detailing and painting will help you achieve realism you may not believe yourself.

By the time Bob Crumley of St. Petersburg, Florida, picks up his tools to start roughing out one of his acclaimed wildlife carvings, he's already many hours into the project. Research accounts for that lead time, and it's as crucial to a successful carving as any of the tools he uses.

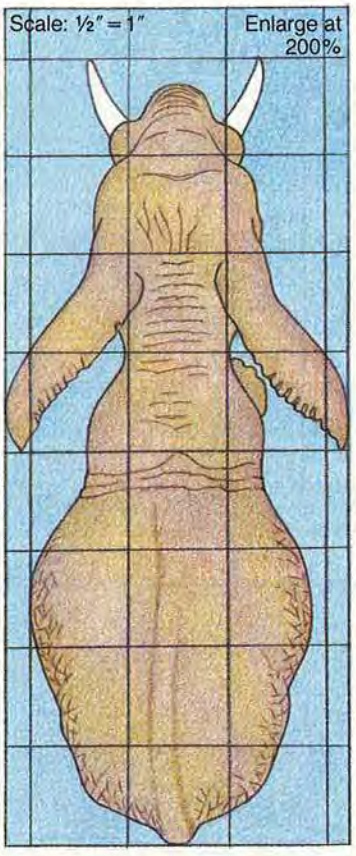
As he carves, Bob frequently refers to the stacks of research material he's gathered—usually photographs and illustrations from books and magazines. He'll even take a trip to the zoo with his camera or sketchbook to resolve anatomical questions about giraffes, elephants, and other exotic animals he has in the works.

For this project, Bob carved an African plains elephant (*loxodonta africana*). This elephant ranks as the largest of the species, and is a creature Bob finds interesting.

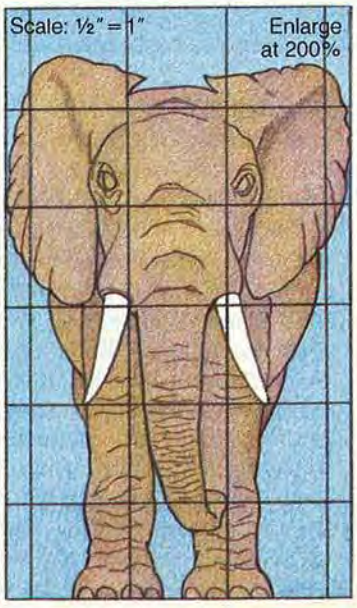
"The African elephant's large ears set it apart from the Asiatic elephant," Bob explains. "The female is slightly smaller than the male, but otherwise they look very much alike since both male and female have tusks," he adds.

Continued on page 50

TOP VIEW



FRONT VIEW



WE USED THESE TOOLS AND SUPPLIES

Stock 4×8×6½" basswood, jelutong, or tupelo. Or, start with a precarved basswood roughout, $24.95 ppd. in U.S., from Rossiter Ruff-Outs and Carving Supply, 1447 S. Santa Fe, Wichita, KS 67211. Call 800/825-2657.

Tools
Flexible-shaft machine or hand-held rotary tool

Kutzall burrs
⅛" taper (T-18-E)
¼" sphere (S-14-E)
¼" flame (FL-14-E)

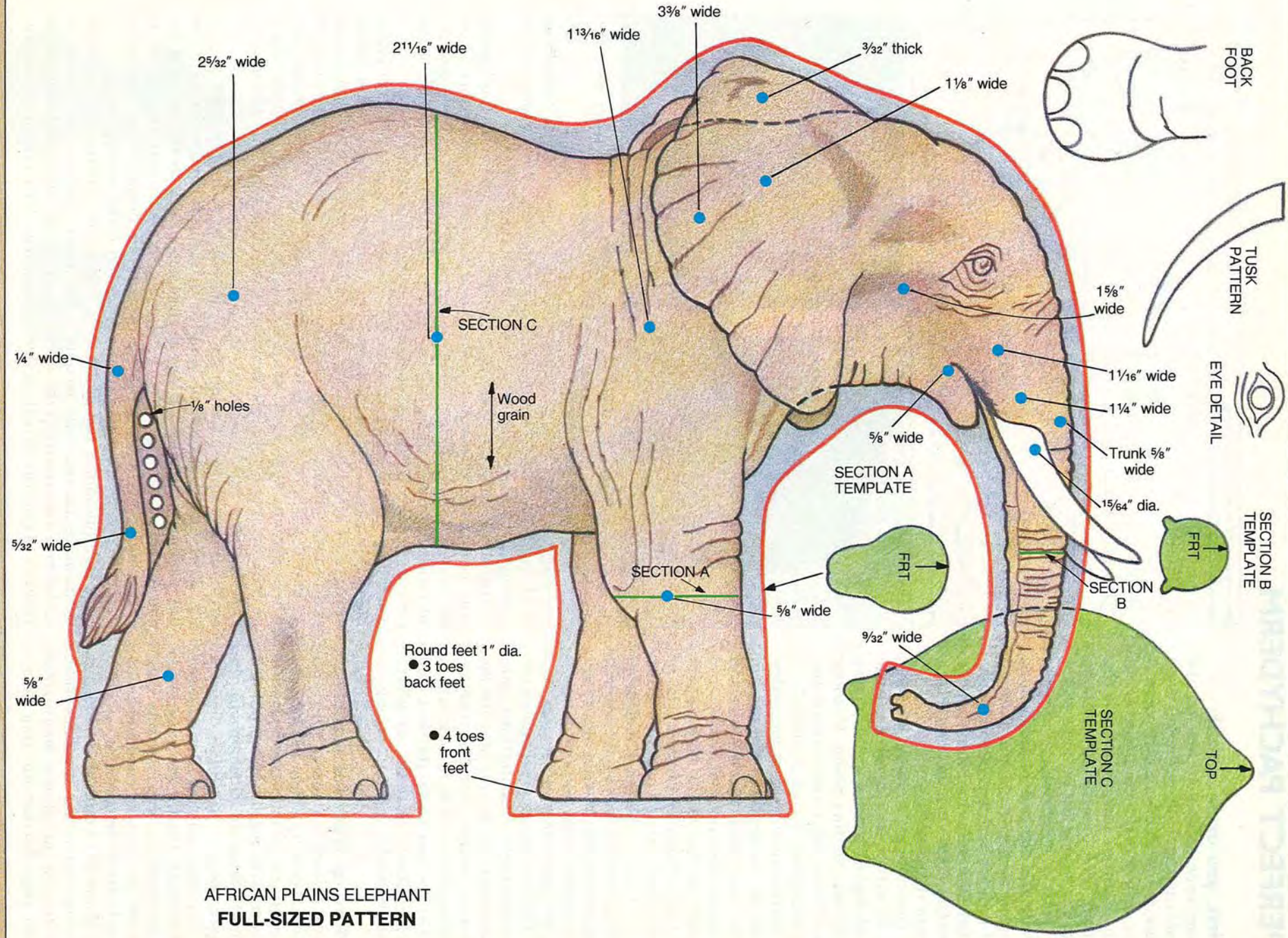
Abrasive point
#41¼ Inverted cone, green grit

Ruby cutters
Small pear, fine grit
Small pear, coarse grit
Large taper, coarse grit

Diamond cutters
Small-diameter pointed taper
Small-diameter round-end taper
Small-diameter tapered cone
Small-diameter ball

Finishing supplies
Wood sealer Black acrylic gesso

Acrylic artist's colors
White, black, raw sienna, raw umber, burnt umber, yellow ocher, deep green



AFRICAN PLAINS ELEPHANT
FULL-SIZED PATTERN

PERFECT PACHYDERM

First, you draw a blank

Start your carving by tracing the *red* cutting line from the full-sized pattern onto a 4×8×6½" piece of carving wood. Note the wood grain direction. Bandsaw the blank. (For a machined roughout, see the supply list on *page 48.*)

Draw a lengthwise centerline along the top and bottom edges. Pencil in the shape and location of the ears and legs on each side. Mark the foot locations on the bottom, following the Foot Placement drawing *right.*

Draw the trunk about ¾" wide, centered on the front. Curl the end slightly toward the elephant's left side, starting about 1" above the bend near the end of the trunk. Offset the tip about ¾".

Start roughing out at the widest part of the carving—the ears, in this case. With the Kutzalls and coarse ruby cutters, reduce the width in this area to about 3⅝".

Carve the body to about 2⅞" at its widest point (pattern section C–C'). For other rough dimensions, add ⅛–¼" to the pattern measurements. Work over the entire surface, but don't remove too much wood in any one area.

Check your progress against the photographs, illustrations, and cross-sections as you develop the general shape. Turn the carving frequently to view it from all angles. As you carve the feet and legs, ensure that the elephant stands firmly, without rocking.

Move up front for a while

Now, work on the mouth and ears. Looking from below, the lower jaw resembles a valentine heart, with the drooping, pointed end forming the elephant's lip *far right above.*

For easier carving, Bob saws off the trunk below the tusk area. "The trunk is the last feature to work on, so you can glue it on easily later," he explains.

Shape the front side of the ears before hollowing the back side. Notice in the photos *above right* and *page 51* that the rolled-over top edge doesn't attach to the head, and the bottom hangs free, joining the head ⅞" up.

Just above this ear-head junction, a bony structure runs toward the front of the head, roughly parallel to the ground. Carve this feature as a speed-bump shape extending 1⅝" in front of the ear. Blend it in as you round the front corners of the head, referring again to the photos.

Draw a 5/32" circle for each eye where shown. Both eyes should be visible from a direct front view. Carve a hemisphere in the circle, using a small diamond cutter. Refer to the Eye Detail with the patterns to carve the upper and lower lids.

The wood will probably become fuzzy when carving the eyes. Bob minimizes the problem by painting the area with lacquer sealer before carving. (He uses Teekay's Rapid-Dri Wood Sealer, available from Curt's Waterfowl Corner, Box 228, Montegut, LA 70377, 800/523-8474.)

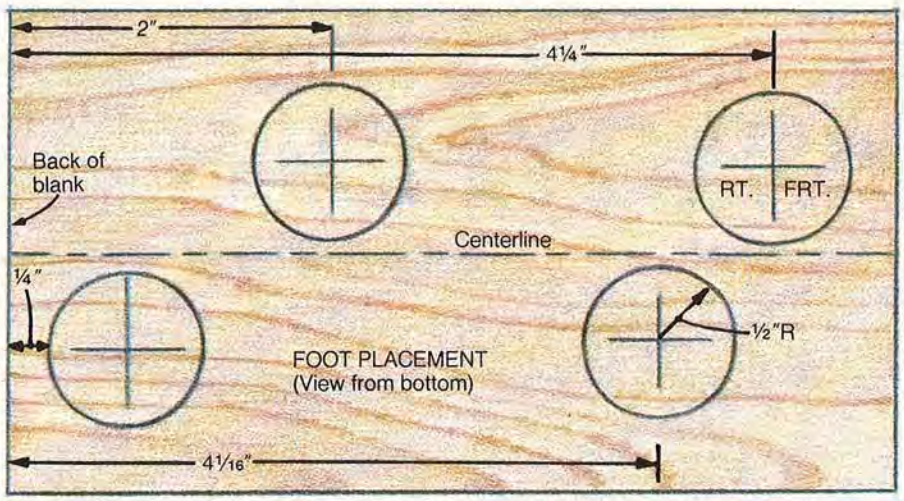
By now, your carving should bear a striking resemblance to an elephant. Before adding the details that make it lifelike, sand the carving smooth.

To texture the skin, engrave random crooked lines with the diamond cutters. "The skin cracks cross in diamond patterns, and vary in depth," Bob points out. Don't make long, straight lines, nor a rigid, repeating pattern.

The saggy, baggy part

An elephant always seems to be wearing skin about one size too large. So, after texturing the skin, carve in deeper folds and wrinkles to make it look baggy.

Study the photographs for wrinkle-prone places—the shoulders, back of the neck, and around the hind legs, for example. Carve the



The ears curl at the top and trailing edge. Note the distinct shoulder bulge.

Carve soft, rounded edges when you model the lower jaw.

wrinkles deeper than the skin cracks, forming folds along natural body contours.

Add skin creases at the joints. "Just look for areas where movement would cause wrinkles, and cut them in," Bob advises. Wrinkle patterns vary from one elephant to another. In fact, some are identifying marks. "On the front-leg knees, the pattern differs for every elephant, just like our fingerprints," Bob explains.

Scallop the trailing edges of the ears. Represent torn spots with a few short, narrow notches in the lower edge.

Carve the toes next. Draw four adjacent semicircles on the front of each front foot, three on each back foot. Incise the lines, and round each toe's edge slightly.

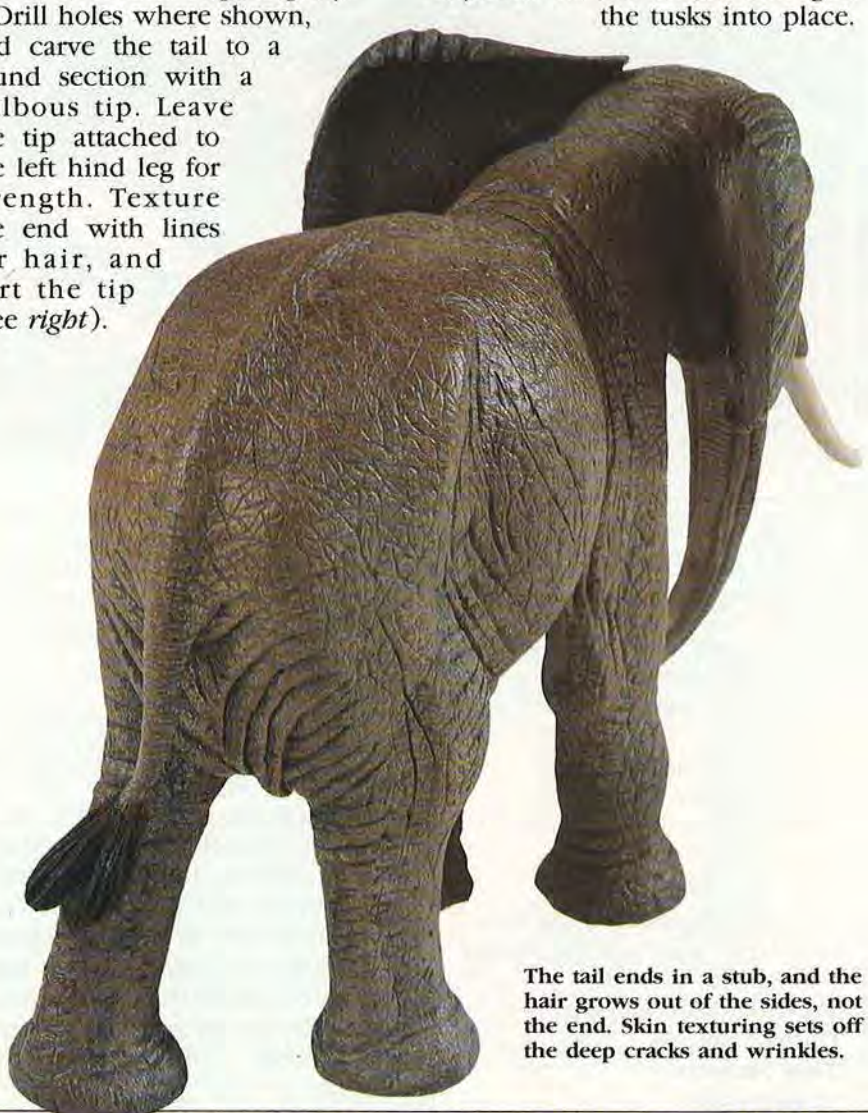
Drill holes where shown, and carve the tail to a round section with a bulbous tip. Leave the tip attached to the left hind leg for strength. Texture the end with lines for hair, and part the tip (see *right*).

Tackle the trunk and tusks

Carve the tip of the trunk to a flattened funnel shape. Then, cut back the sides where shown on the pattern to form a pair of fingers (African elephants pick things up with them). Refer to the photo *opposite page, far left,* and bore 2 nostrils into the end.

Carve the rest of the trunk to shape. Form the two sinewy strands on the underside as you carve the corrugations. Now, glue the trunk onto the head, and blend it in.

From scraps, carve two round, curved tusks. Don't worry about making them exactly alike—they rarely are on real elephants. Flatten the bottom front end on each to simulate wear. Then, drill holes adjacent to the trunk, and glue the tusks into place.



The tail ends in a stub, and the hair grows out of the sides, not the end. Skin texturing sets off the deep cracks and wrinkles.

Inspect the carving closely, and clean up any flaws before painting. To prepare the carving for painting, Bob goes over it with a defuzzing pad (from Curt's Waterfowl Corner). Then, he applies two coats of sealer.

Paint it black

Coat the carving with black acrylic gesso (available from art-supply stores). Thin the gesso so it flows into the texturing without filling it up. Wipe the gesso off, leaving the black in the skin wrinkles and folds for shadow effect.

After the gesso dries, paint the carving with acrylic artist colors. First, apply a base coat of muddy gray—a mixture of raw sienna, black, and a bit of white. Mix a color you like, or match the color shown in the photographs. "Painting is an experiment," Bob remarks, "and an elephant's color varies greatly, depending on the amount of mud and dust on it."

Highlight the hide

After the base coat dries, mix some base color with a small amount of yellow ocher, and dry-brush it on to highlight the texture. To dry-brush, pick up some paint on the brush, and then wipe most of it off. Brush the carving with light, quick strokes. Don't try to cover the entire carving.

Next, without waiting for the paint to dry, dry-brush with raw umber, followed by raw umber mixed with yellow ocher. Dry-brush yellow ocher highlights on the top of the ears, head, and back, as if the elephant was standing in the sun.

Paint the eyes with raw sienna, adding a dot of burnt umber for the pupil. Dry-brush the tail hair, using burnt umber with a small amount of black added. Paint the tusks with two coats of titanium white. When dry, brush on a thin wash coat of white with a bit of raw sienna added. For sheen, apply two coats of clear lacquer to the eyes and tusks when dry.

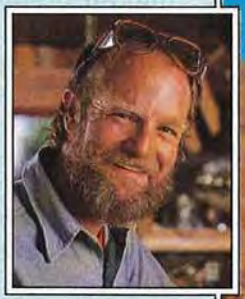
Continued on page 76

Turning Betw

Practice these pointers and watch your results improve

Few things top the pleasure of watching a chair spindle, table leg, or other object take shape between the centers of a lathe. Of course, the possibilities go well beyond furniture parts. Just a few: candle holders, rolling pins, goblets, lamp bases, salt-and-pepper shakers, tool handles, noodle cutters, gavels, stair balusters, mallets, and pens. Whew!

To help you accomplish a variety of spindle projects, we asked expert Rus Hurt for a clear, straightforward approach to this subject. As you'll see here, he didn't let us down. Like most tasks, in woodturning, practice makes perfect. Practice also translates into fun. Why? Once you master the basics, you can confidently put a lathe tool to a spinning piece of wood without the likelihood that the tool will catch and mar the workpiece, or chatter wildly in your hands. With enough practice, wood shavings, not dust, will eagerly dance off your workpiece, leaving a surface that requires minimal sanding.



Rus Hurt

With this in mind, Rus, a seasoned woodturning pro from Port Wing, Wisconsin, came up with a surefire practice routine for honing your skills. We'll also share with you some of his valuable tips, and show how to embark on, and complete, a project turned between centers.

You'll need these tools and supplies

Rus suggests the following tools and accessories for a basic between-centers-turning kit:

Tools

- 1¼" roughing gouge
- 1⅛" skew chisel
- ½" or ¾" skew chisel
- ½" spindle gouge
- ⅜" spindle gouge
- 3⁄16" diamond parting tool

Grinder (rough and fine stones)
Face shield *(a must!)*
Mallet (dead-blow type)
Outside calipers
Tape measure
Straightedge
Pencil

But, even Rus's method won't work with dull tools. If you need help here, check out his sharpening pointers in the June 1992 issue of *WOOD*, *pages 36–38.*

Prepare the stock

If you're working with square stock such as 2" or 3" turning squares, mark centerpoints on both ends at the intersection of diagonal lines drawn between opposing corners. If your completed workpiece will have a squared section (such as the four-sided section at the top of a table leg), you must square the stock so each face is the same width and forms a 90° angle with adjacent faces.

Print this article

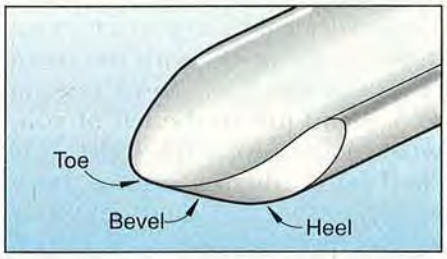
een Centers

PROVEN TECHNIQUES FROM THE SHOP TESTED WOOD MAGAZINE SHOP

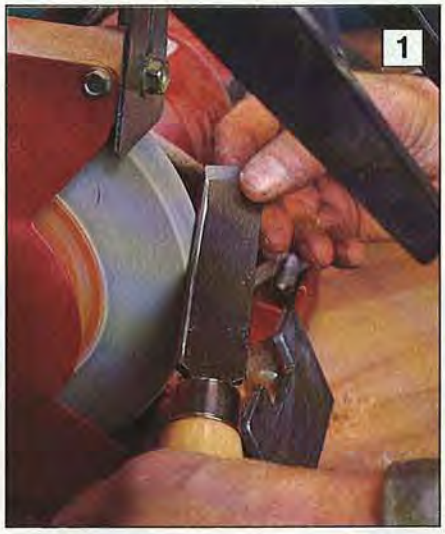
Rus's rules for better turning

Before stepping up to the lathe, keep in mind Rus's sound advice:

- **Always wear eye and face protection.** A full face mask protects you from flying chips of wood or other debris such as embedded nails, lead shot, etc.
- **Ride the bevel.** This rule can't be emphasized enough. Start every cut with the heel of the tool against the workpiece, and then raise the tool's handle until the bevel rubs the workpiece and the toe makes a cut.



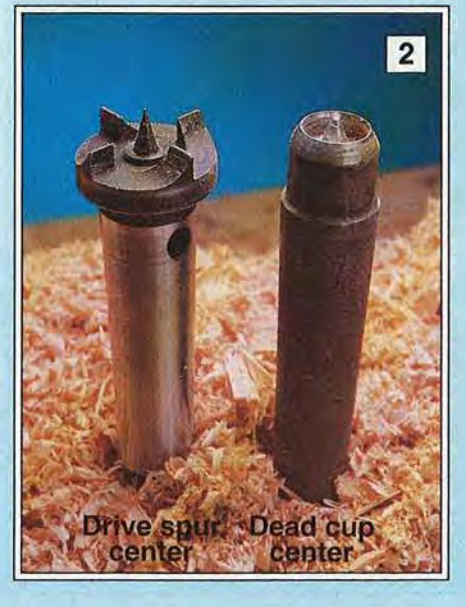
- **Rough slow, turn fast.** Before turning your lathe on, check the machine's speed. Remember that larger, out-of-round workpieces require slow speeds. Generally, you can complete most roughing tasks at around 800 rpm, then change the lathe speed to about 1,500 rpm for shaping cuts.
- **Keep the tool rest close to the workpiece.** The tool rest gives your tool stability, so position it within ½" of the workpiece. Check the rest's position by rotating the workpiece by hand before turning on the lathe.
- **Round the edges of your tools.** Rus grinds round-overs on the edges of his skew chisels and scrapers as shown in Photo 1. This makes the tools more comfortable to hold, and easier to smoothly slide across the tool rest.



- **Position the lathe at a comfortable height.** To reduce fatigue and improve your results, adjust your lathe so the centers are 1" higher than your elbow.

We do this by truing two adjacent faces at 90° to one another using a jointer. Then, we cut the other two faces with a tablesaw. For more advice on this subject, see *page 71* of the January 1992 issue of *WOOD* magazine.

Although most lathes come equipped with a drive spur center for the headstock, Rus prefers a slightly different approach. He places a dead cup center in the headstock (see Photo 2 for a look at centers). This way, if your tool catches, the work will stop spinning, with little damage to the workpiece or your nerves. Rus prefers using a live cup center in the tailstock.



Now, with the dead cup center removed from the lathe, align its sharpened point with the centerpoint on one end of your stock. Tap the end of the cup center with a dead-blow mallet to make an indentation in the end of the stock. Replace the dead cup center in the lathe, align it with its matching indentation, and align the centerpoint on the other end of your workpiece with the tailstock center. Finally, securely sandwich the workpiece between the headstock and tailstock centers. Employ enough pressure so that the workpiece does not stop spinning under the cutting pressure of your tool.

Continued

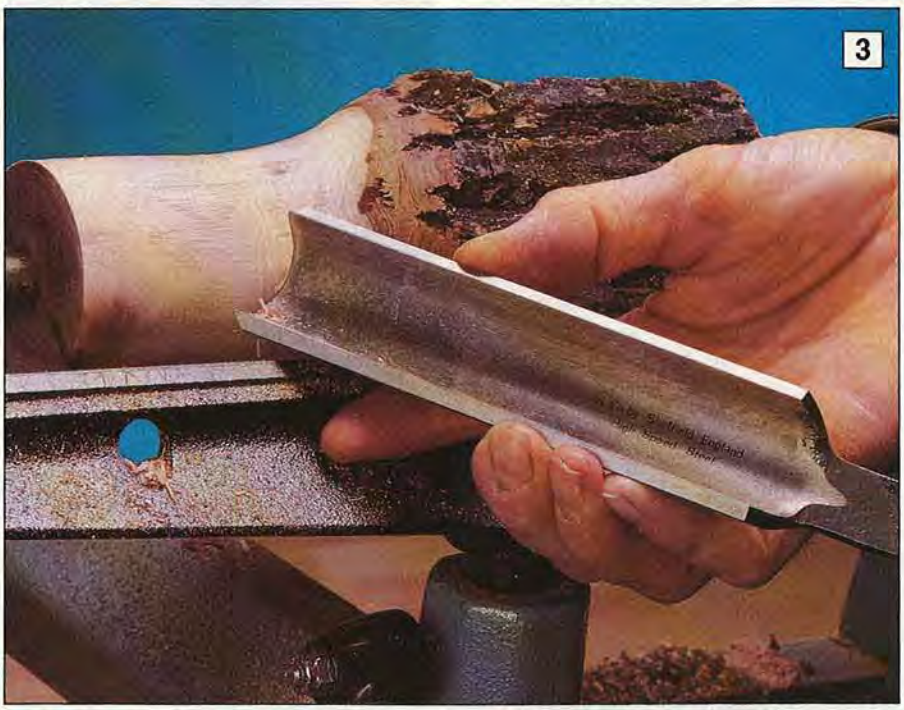
A surefire routine for perfecting your skills

No matter how much you study woodturning, you simply have to put in hours of practice before you develop a good feel for how to position and move your turning tools. You can't get around it. The good news is that you only need to master a few basic procedures. These six will see you through most projects.

Note: *If possible, practice these techniques using short and straight tree limbs 3–4" in diameter. Green wood turns much easier than dried stock, and you can't beat the low price!*

• Rounding down

Before you make any shaping cuts on a turned object, round it down to a rough cylinder. To do this, hold a roughing gouge as shown in Photo 3, with the gouge rolled slightly toward the direction that you're cutting (from right to left in the photo). Drop the tool handle below the tool rest and move the gouge across the workpiece following the sequence *bottom*. Note how Rus positions his index finger behind the tool rest for a consistent depth of cut.



• Smoothing

To smooth the surface, adjust the tool rest up and position a large skew chisel near the top of the workpiece as shown in Photo 4. Skew chisels come from the factory with straight edges, but note in the photo that Rus grinds the edge to a slight arc to help it cut more effectively. To avoid catching the corners of the tool on the workpiece, restrict the cutting action to the middle of the edge.

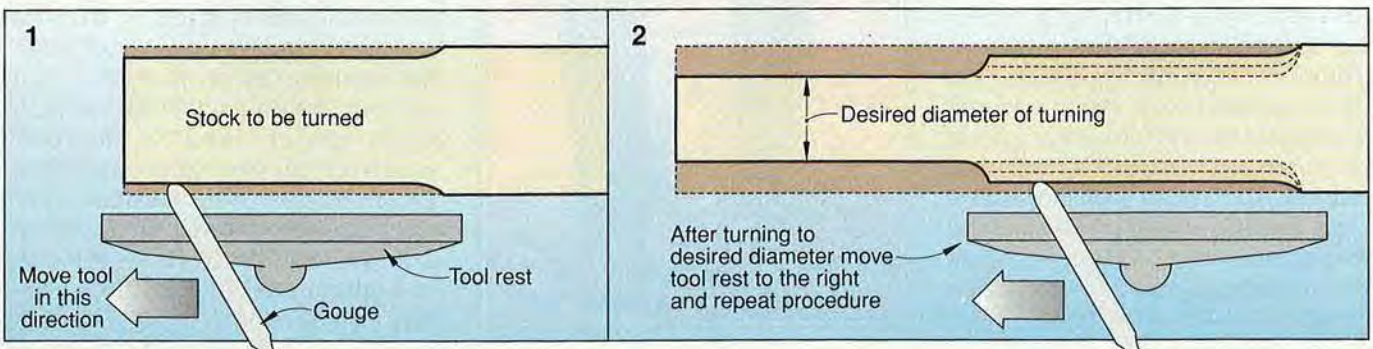
• Making beads

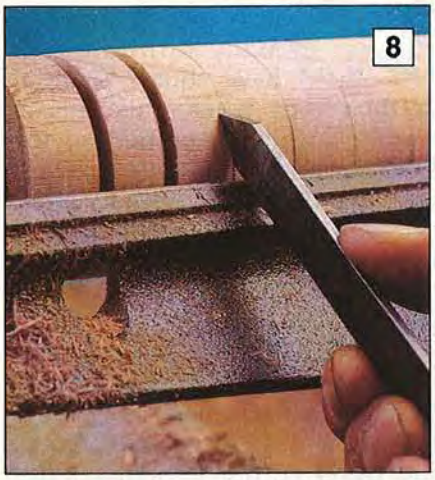
With your lathe running, mark pencil lines about ¾" apart along the smoothed surface. These lines mark the center of the V-shaped cut between the beads.

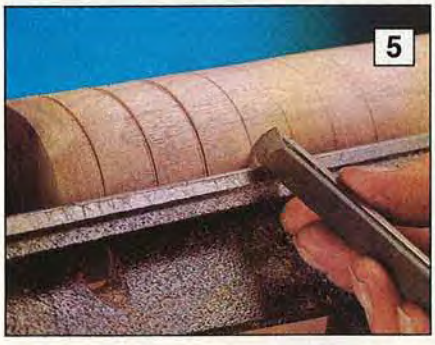
At every marked line cut to a depth of about ⅛" with the point of a skew chisel as shown in Photo 5. Stand just to the left of your workpiece and with light cuts "peel back" the left side of the V with a ½" or ¾" skew chisel as shown in Photo 6.

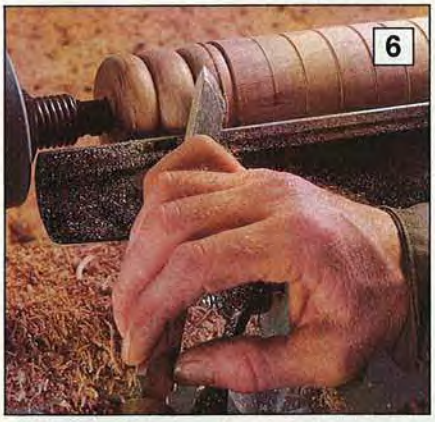
With the left side of the V completed, stand to the right of the workpiece and cut the right side of the V as shown in Photo 7.

Note that you must roll the chisel as you cut to keep its bevel in contact with the workpiece.


1
Stock to be turned
Move tool in this direction
Tool rest
Gouge
2
Desired diameter of turning
After turning to desired diameter move tool rest to the right and repeat procedure





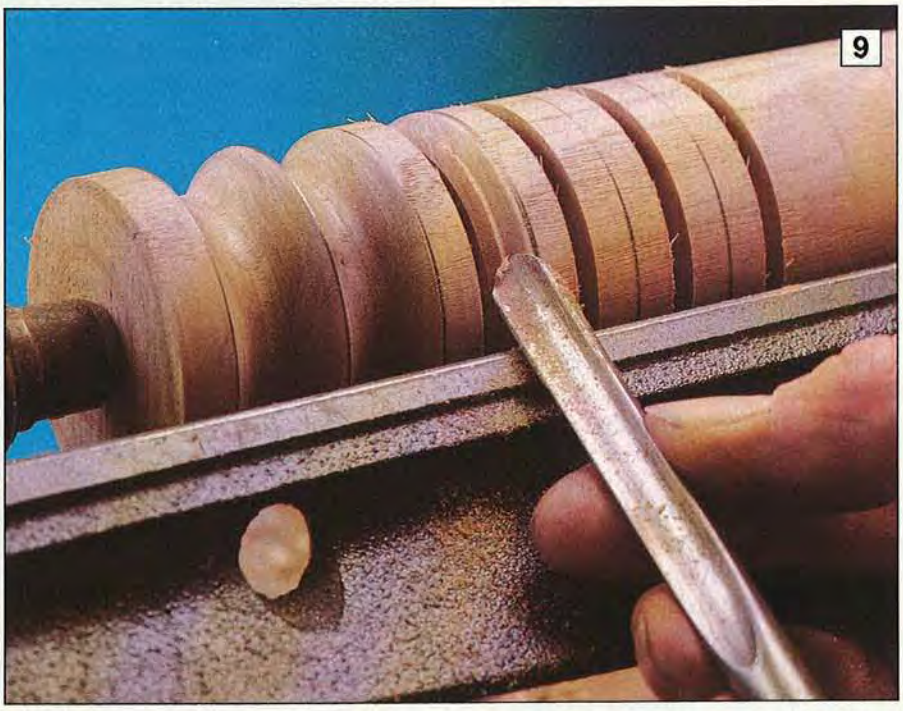


• Cutting coves

Smooth your practice piece again, and make ¼"-deep parting cuts about 1" apart as shown in Photo 8. Beginners tend to put the point of the tool straight into the workpiece. Don't! Instead, remember to start the cut with the heel of the bevel on the workpiece. Slowly raise the tool handle to initiate the cut.

Now, mark lines midway between each parting cut. With a ½" or ⅜" spindle gouge, cut each side of the cove with the gouge rolled slightly on its side as shown in Photo 9.

Rus holds the handle of the tool in his right hand when cutting the left wall of the cove, and switches hand positions when cutting the right wall. This helps maintain solid contact between the bevel and the workpiece.

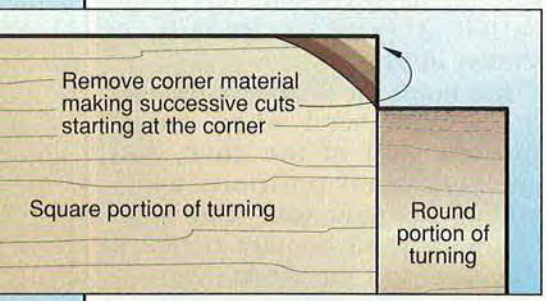


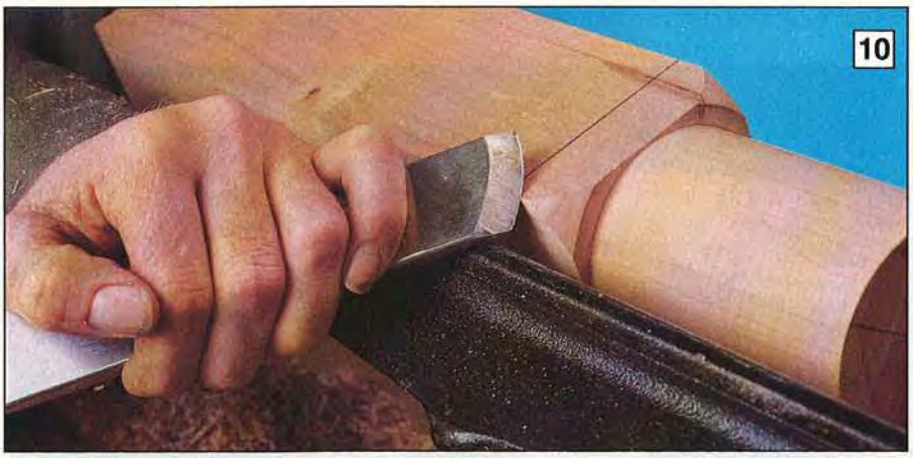
Continued

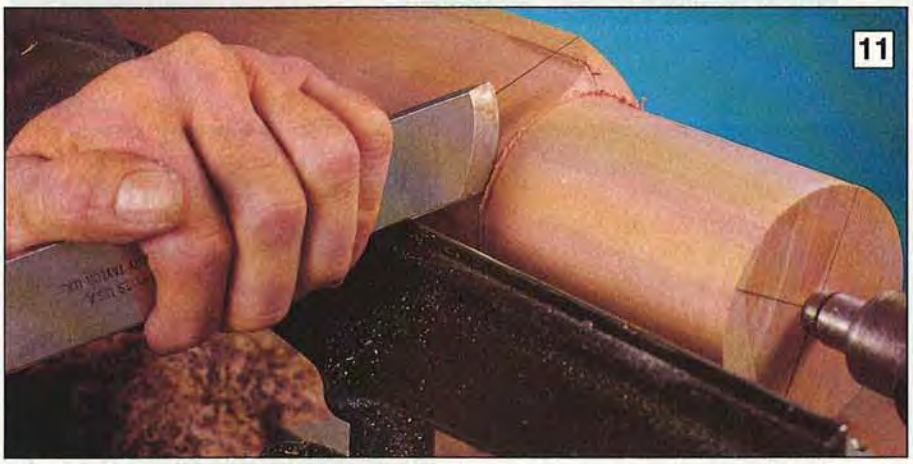
• Transitioning from a square section to a cylinder

Many furniture legs have square sections at their tops where rails attach. Cutting away the corners at the bottoms of these square sections can be tricky business because these unsupported corners tend to chip and splinter, especially when you're working with hard or brittle stock.

To get the job done, hold a large skew chisel as shown in Photo 10, and make successive light cuts as depicted *below*. Keep the bevel of the tool in contact with the workpiece by rotating the tool throughout each pass. Photo 11 shows the tool's position at the end of each pass.


Remove corner material making successive cuts starting at the corner
Square portion of turning
Round portion of turning

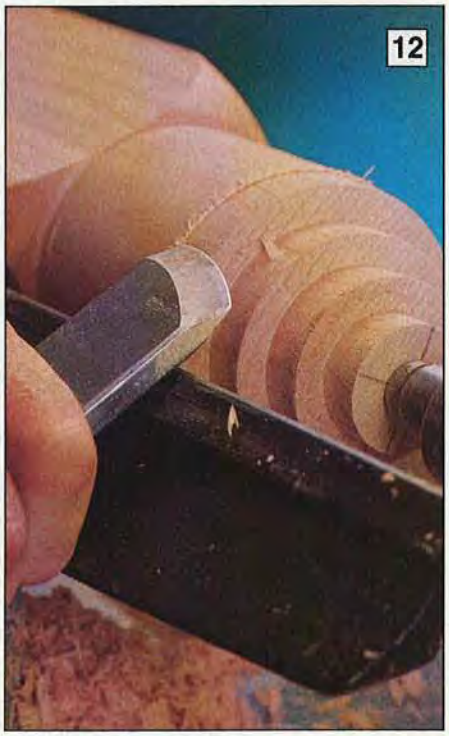


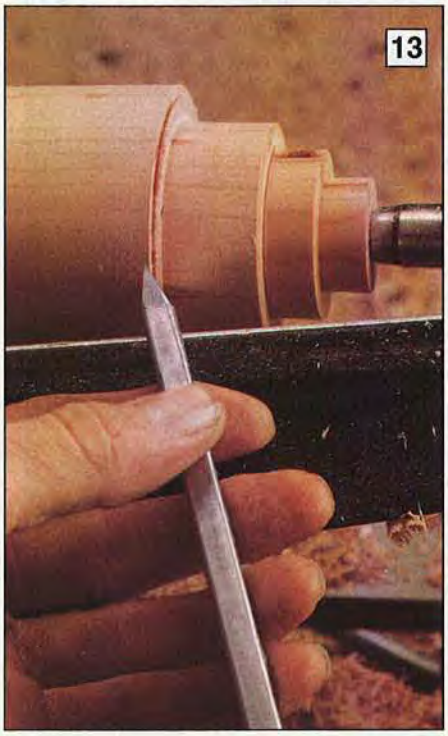


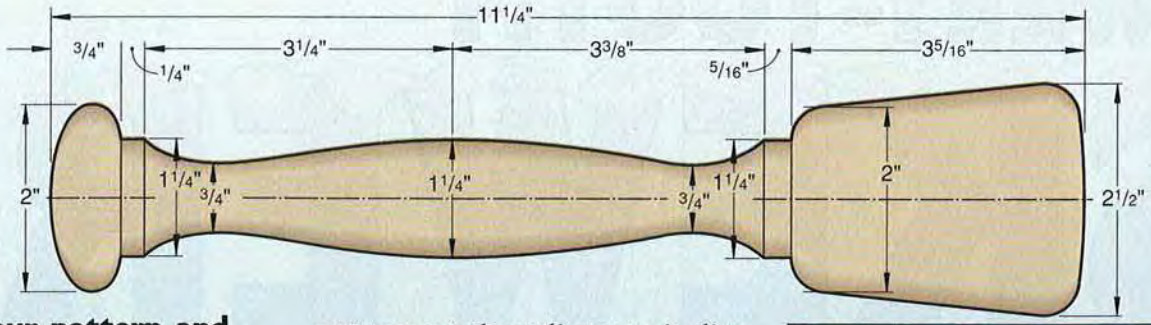
• Cutting square shoulders

This shape can also be tricky because of end-grain tearout on the vertical wall of the shoulder. To be successful you need to make two cuts, one called a "peeling" cut, the other referred to as a "slicing" cut.

First, hold a large skew chisel as shown in Photo 12 to make the peeling cut. This quickly wastes a lot of material, but it leaves a rough vertical wall. So, you need to slice the wall away holding the same tool with its pointed end down as shown in Photo 13. Remove no more than 1/16" of material. Gradually raise the tool's handle so it's almost level by the end of the cut.







Lay out your pattern and transfer it to your project

Like a road map to guide you on a trip, you need a full-size drawing of your turning project to steer you to its completion. As shown in the example *above* of a potato masher, your pattern should show key diameters and spacing between those diameters.

Next, transfer the positions of the diameters to your rounded-down turning blank as shown in Photo 14. To make the lines more visible, switch on your lathe and hold a pencil against the stock at each mark.

For each diameter on your pattern, set your outside calipers about 1/16" shy of the finished diameter. (This leaves you extra material for final cuts and sanding later.) Make a parting cut at each marked diameter as shown in Photo 15. Put slight downward pressure on the calipers so it slips through the cut when you reach the correct diameter.

Note in the drawing *below* that you should part down to your thinnest diameters only after you remove all of the material between the largest diameters. This keeps the workpiece from wobbling unnecessarily.

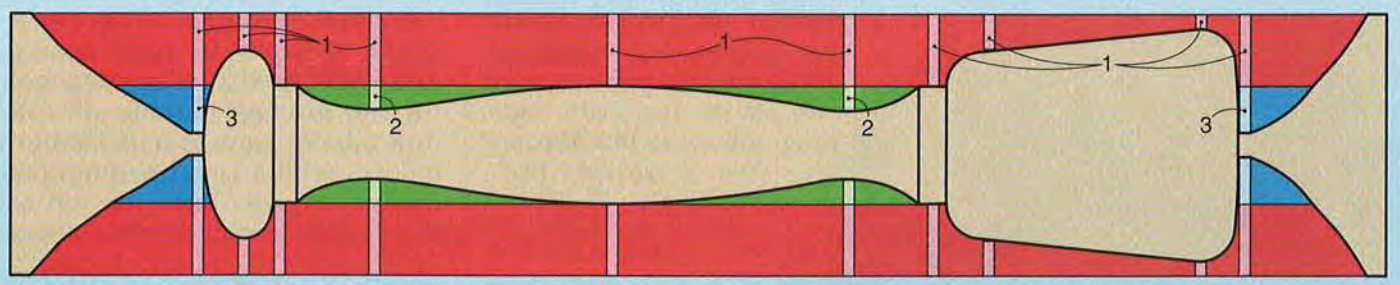
Sanding and finishing

With your project completely turned and still mounted in the lathe, sand it with a succession of abrasives (120-, 220-, and 400-grit abrasives should do the trick). Set your lathe to about 1,500 rpm, and hold the sandpaper underhand as shown in Photo 16. After sanding, make the final parting cuts shown in the drawing *below* and in Photo 17.

With the lathe on its slowest speed, brush or spray on your finish while the workpiece spins. If you rub in your finish, you should leave extra material at each end of the workpiece so it doesn't break off.

Finally, unmount the workpiece and saw away the excess stock at each end. Smooth and finish each end.

Written by Bill Krier with Rus Hurt
Illustrations: Kim Downing
Photographs: Hopkins Associates



1 First series of parting cuts.
Remove this material after making first series of parting cuts.

2 Second series of parting cuts
Remove this material after making second series of parting cuts

3 Final parting cuts (after sanding is completed).
Final material removed

Print this article

SWEET-TOOTH SKEWERS FOR CARAMEL-APPLE LOVERS

We used these tools and supplies

Stock

1¼×1¼×6″ hardwood, one piece for each skewer. (You'll need 14 skewers for our caramel apple recipe.) We used odds and ends of maple, walnut, and cherry from the scrap bin.

Lathe tools

Drive center, tail center
Spindle gouge, ¼″ and ½″
Skew, ½″
Parting tool, 1⁄16″ and ⅛″

Lathe speeds (rpm)

Turning, sanding: 1100–1400

Caramel apples! What a treat! But as a woodworker, aren't you just a little put off by those boring sticks? For apples with flair, first turn these slick skewers. Then, for flavor to match, try our caramel apple recipe, straight from the *Better Homes and Gardens*® Test Kitchen.

Photocopy the full-sized patterns on the *opposite page*. Then, locate and mark the center on each end of each piece of stock.

Mount the stock between centers. (We used a spur drive center and a cup tail center.) With the lathe running at about 1100 rpm, round the square down to 1″ diameter, using a ½″ gouge.

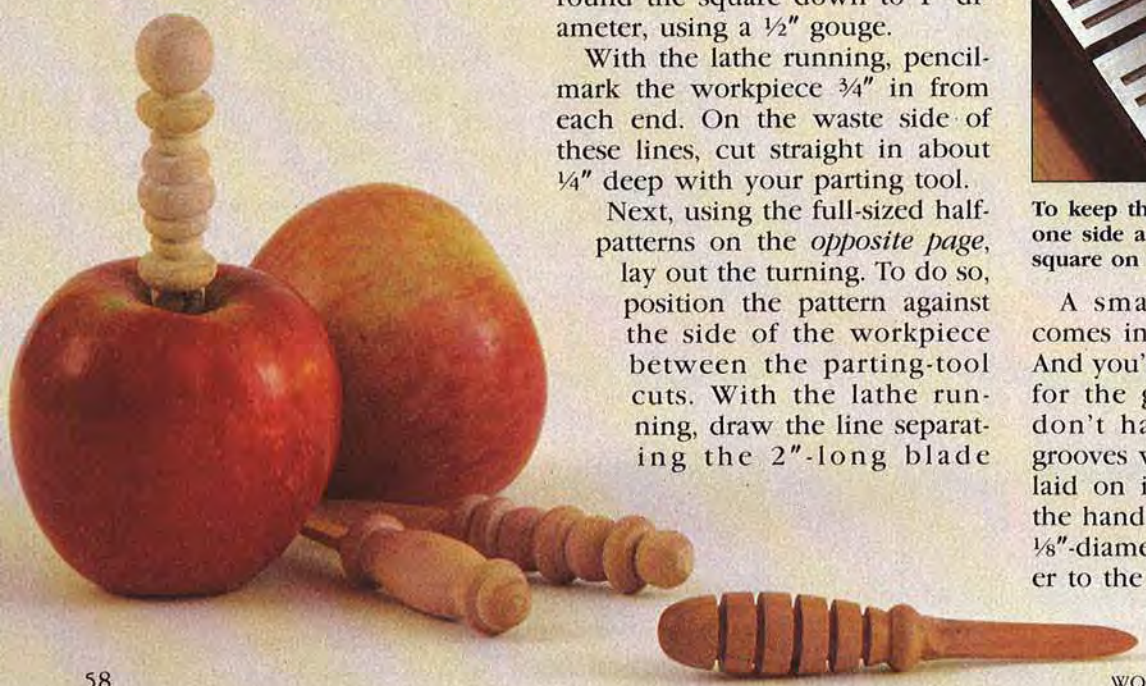
With the lathe running, pencil-mark the workpiece ¾″ in from each end. On the waste side of these lines, cut straight in about ¼″ deep with your parting tool.

Next, using the full-sized half-patterns on the *opposite page*, lay out the turning. To do so, position the pattern against the side of the workpiece between the parting-tool cuts. With the lathe running, draw the line separating the 2″-long blade portion of the turning from the 2½″-long handle. (We placed the blade end at the tailstock.) Mark the handle features with a pencil line at each template mark.

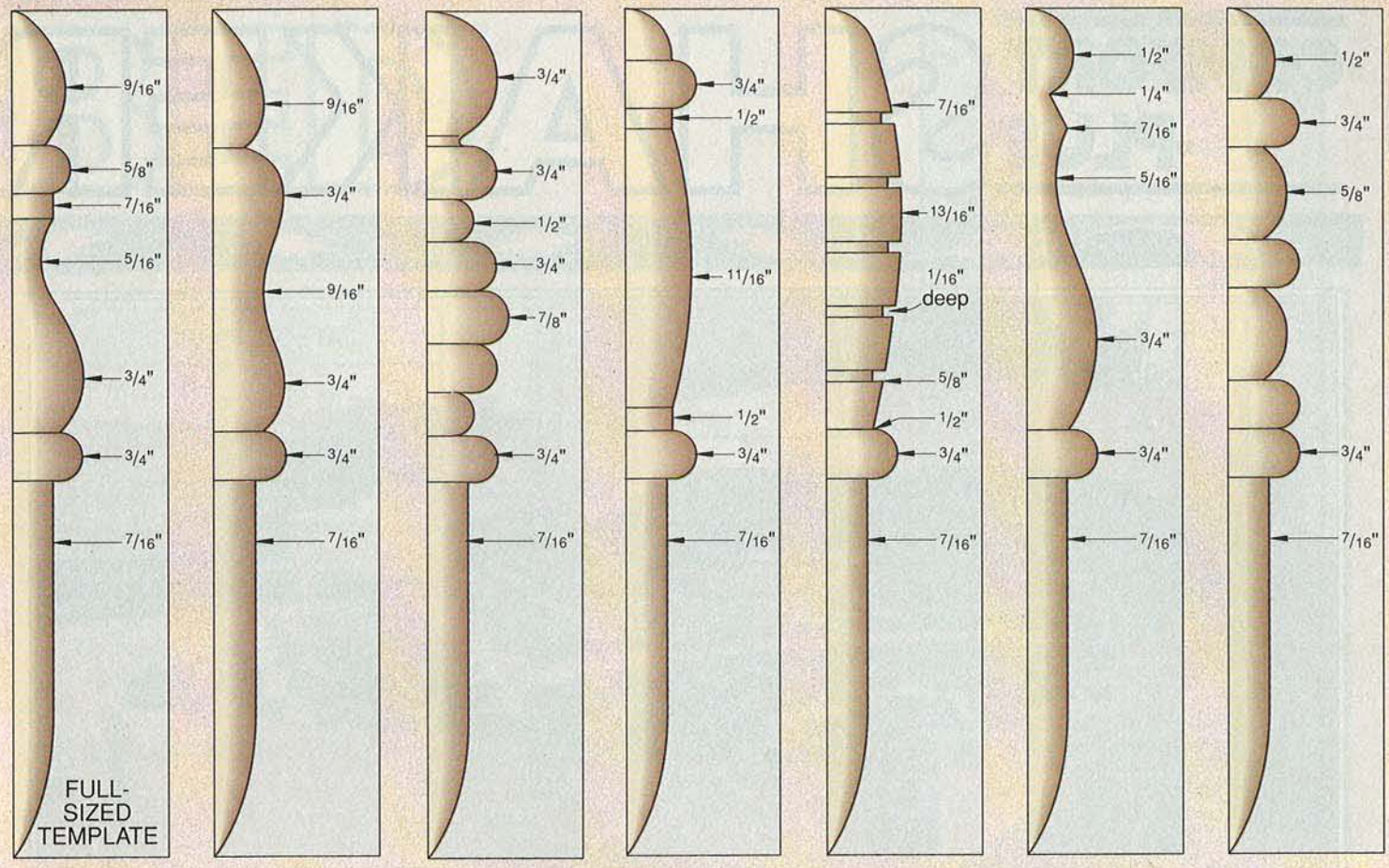
Turn the blade portion to 7⁄16″ diameter with a skew or gouge. Don't taper the end just yet. Shape the handle with the same tools.

To keep the skewer sides parallel, sand one side and then hold it against a try square on the sander table.

A small gouge—¼″ or so—comes in handy for some details. And you'll need a 1⁄16″ parting tool for the grooved handle. If you don't have one, cut V-shaped grooves with a larger parting tool laid on its side. Turn the top of the handle, leaving a tenon about ⅛″-diameter to connect the skewer to the waste.



FULL-SIZED PATTERNS



Turn the blade to a point, leaving a ⅛" supporting tenon at the end. Sand the skewer with progressively finer grits from 100 to 400. Now, cradle the turning in your hand, and part it from the lathe at the top of the handle. Saw the waste from the pointed blade end with a coping saw.

To form the blade, sand one side flat. (We used a 1" belt sander.) Then, to keep the two flat sides parallel, place the sanded side against a try square as shown on the *opposite page* to sand the other side. Make the blade about ⅛" thick.

Finish-sand the blade. Apply a clear, food-safe finish overall. (We used salad-bowl finish.) Then, take your skewers and our recipe to the kitchen to make your well-deserved treat.

Project Design: ©Workshop Blueprint Co., David Ashe
Photographs: John Hetherington;
Illustrations: Kim Downing

Caramel apples

14 small tart apples
½ cup butter or margarine
2 cups packed brown sugar
1 cup light corn syrup
1¼ cups (one 14-oz. can) sweetened condensed milk
1 teaspoon vanilla

Wash and dry the apples; remove the stems. Insert a skewer blade into the stem end of each apple.

Melt the butter in a 3-quart saucepan. Stir in the brown sugar, corn syrup, and a dash of salt. Mix well. Bring to a boil over medium heat, stirring constantly. Stir in the milk. Cook to 245° (firm-ball stage) for 12–15 minutes, stirring the mixture constantly. (The mixture should boil gently over its entire surface.) Remove from the heat, and add the vanilla.

Dip each apple into the mixture, coating it evenly. Chill on a buttered baking sheet.

The tradition lives on

COMFORT-PLUS SHAKER

Cheval Mirror
January 1992
Issue no. 49

Tall Chest
October 1992
Issue no. 55

To accompany our Shaker-styled tall chest and cheval mirror, our design editor Jim Downing designed and built this queen-sized bed. For ease in assembly and moving, the bed features knock-down hardware. To complete the set, we'll be offering plans for a blanket chest and night tables in the future. How's that for a roomful of beautiful, complementary furniture?

Note: *If you don't have the issues mentioned at left but would like a photocopy of the tall chest and/or cheval mirror articles, send a self-addressed stamped business-sized envelope and $2/article to WOOD Magazine's Shaker Furniture, 1912 Grand Avenue, Des Moines, IA 50309-3379.*

Start with the laminated legs

Cut four 1 1/16"-thick pieces and two ¾"-thick pieces to 2⅞ × 37" for the headboard legs (A). (We used cherry, a wood relied on by Shaker craftsmen. The 37" dimension is 1" longer than the finished length of the leg.)

Text continued on page 62

BED

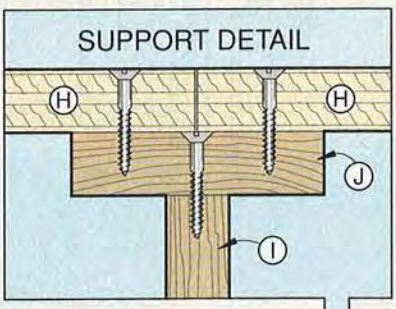
Bill of Materials

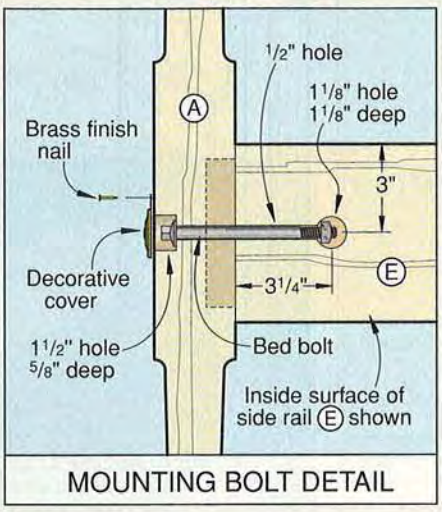
Part		Finished Size T	W	L	Matl.	Qty.
A*	headbrd. leg	2¾"	2¾"	36½"	LC	2
B*	footbrd. leg	2¾"	2¾"	21⅝"	LC	2
C	rails	1¼"	6"	63¼"	C	2
D	headbrd. top	¾"	11¾"	63¼"	EC	1
E	side rails	1¼"	6"	81¾"	C	2
F	cleats	¾"	¾"	80"	C	2
G	cleats	¾"	¾"	60"	C	2
H	panels	¾"	40¾"	61⅝"	PL	2
I	support	1 1/16"	4"	12"	C	1
J	support	¾"	3"	12"	C	1

*Initially cut parts marked with an * oversized. Then, trim each to finished size according to the how-to instructions.

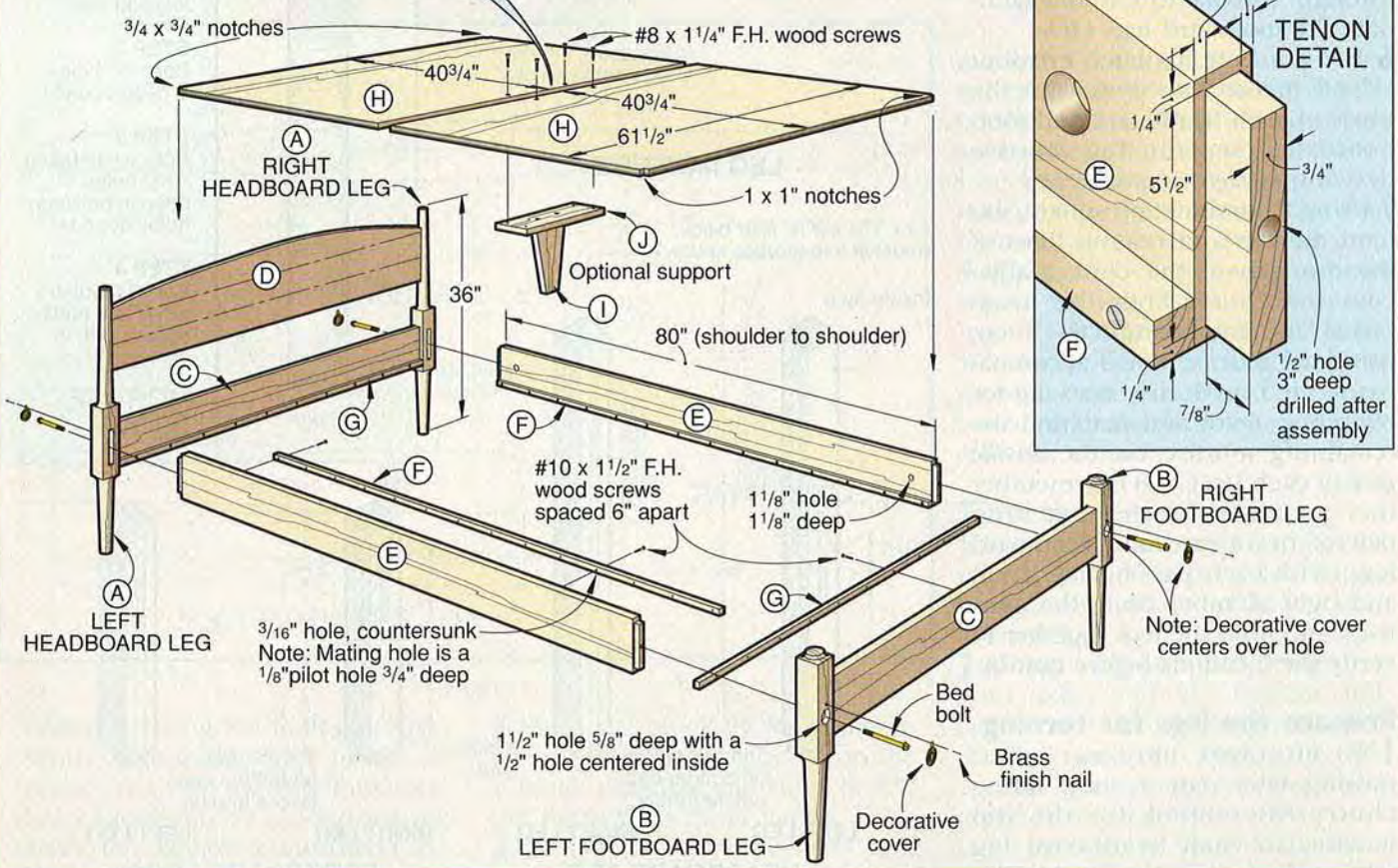
Materials Key: LC–laminated cherry, C–cherry, EC–edge-joined cherry, PL–plywood

Supplies: #10×1½" flathead wood screws, #8×1¼" F.H. wood screws, finish.





EXPLODED VIEW



2 To form two of the mortises, mark and cut a pair of notches in the two pieces of ¾" stock where dimensioned on the Leg Lamination drawing. (We bandsawed the notches to shape; you also could use a jigsaw.)

3 Spread an even coat of glue on the mating surfaces of the three pieces making one leg. Be careful to keep glue off the areas next to the notched openings. With the edges and ends flush and a *notched* piece in the middle, glue and clamp the pieces face-to-face to form one leg (A). Remove any glue from the notches before it hardens. Repeat the process to laminate the second leg.

4 Scrape the glue from the edges. Then, joint or plane 1/16" from each laminated edge for a 2¾"-square lamination.

5 Starting with 22⅛"-long stock, repeat the process in steps 1 through 4 *above* to cut and laminate the footboard legs (B).

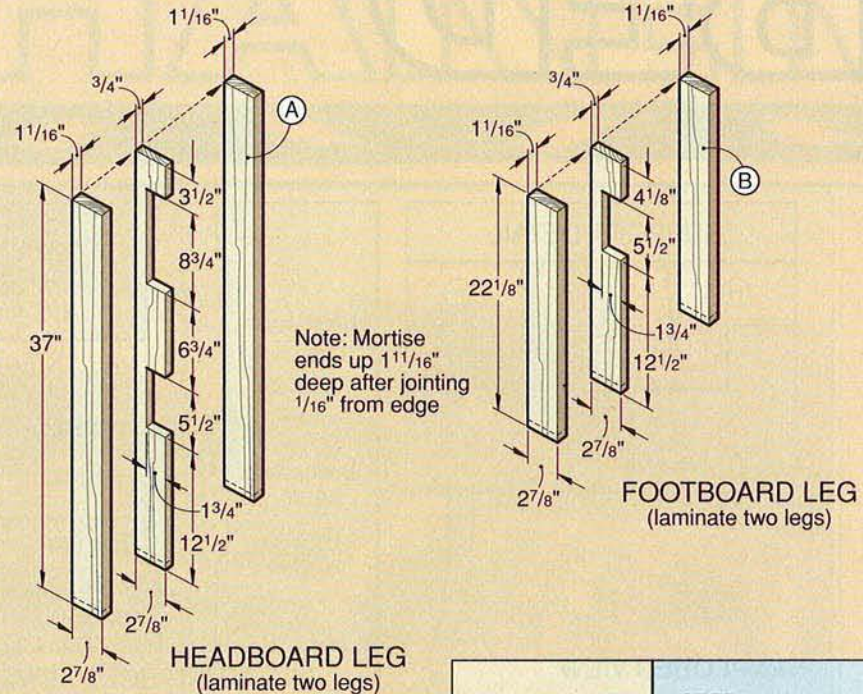
6 For flat bottoms later, crosscut ½" off the *bottom ends* (not the tops) of each headboard and footboard leg. See the Leg Mortise drawing at *right* for reference.

7 Using a combination square, extend the top and bottom lines of the mortises to the correct adjacent surface on both the headboard and footboard legs. Then, using the Mortise detail accompanying the Leg Mortise drawing for reference, mark and machine the remaining mortise on the *inside face* of each leg (A, B). Remember that you're making a matching pair of headboard and footboard legs, with each pair having a left and right member. Mark the mortises, and hold the legs together to verify the locations before cutting.

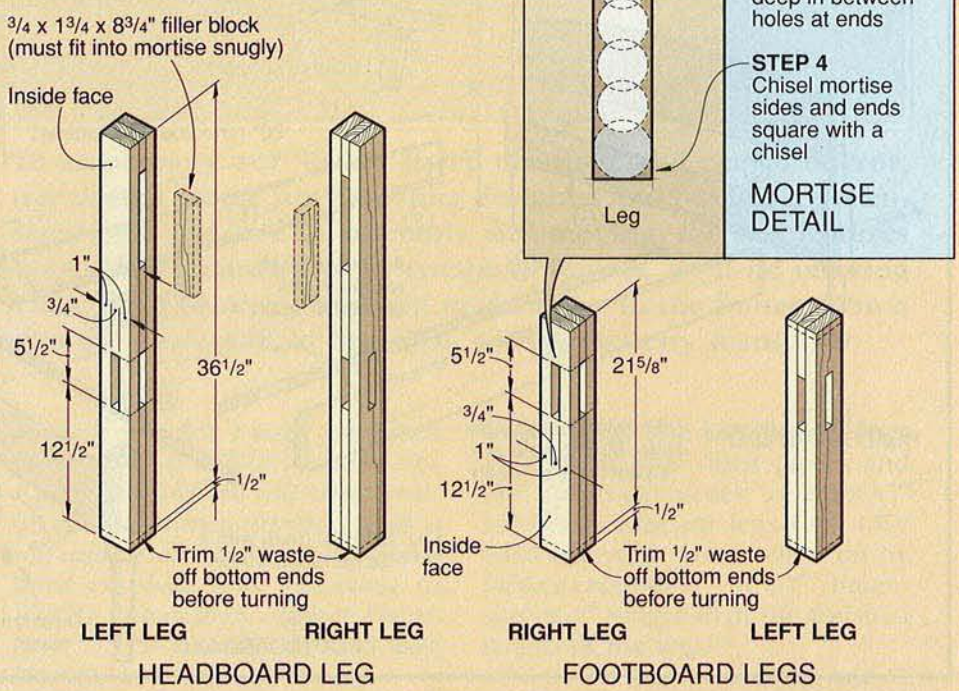
Prepare the legs for turning

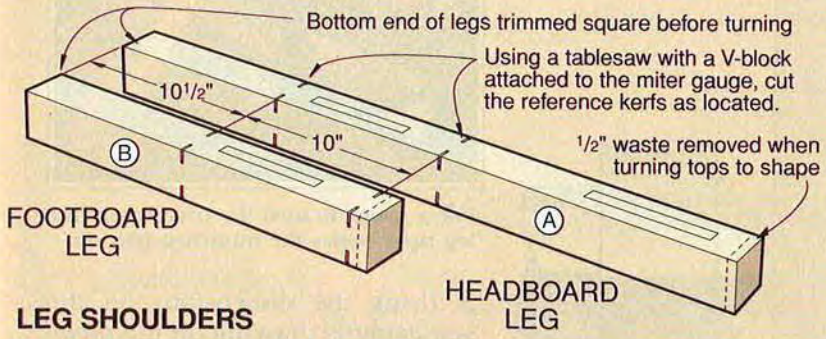
1 To minimize chip-out when turning later, cut a snug fitting cherry filler block for the top mortise in each headboard leg where shown on the Leg Mortise

LEG LAMINATION

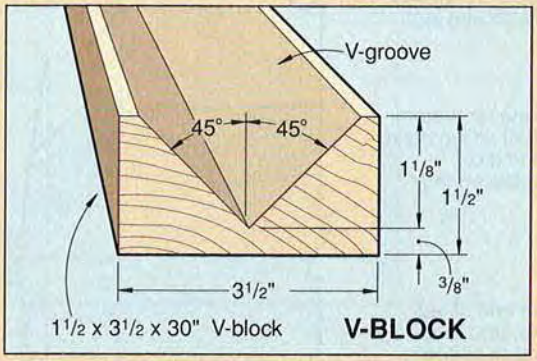


LEG MORTISE



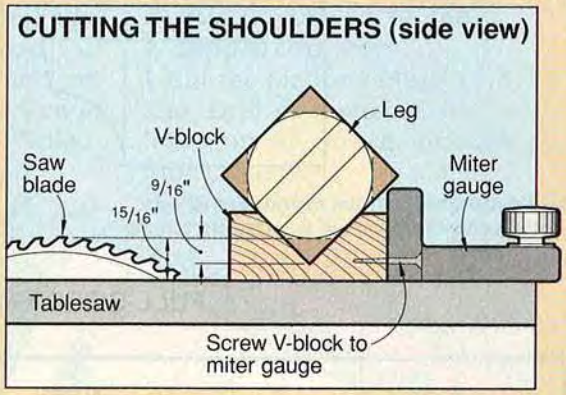

Bottom end of legs trimmed square before turning
Using a tablesaw with a V-block attached to the miter gauge, cut the reference kerfs as located.
1/2" waste removed when turning tops to shape
10 1/2"
10"
B
A
FOOTBOARD LEG
HEADBOARD LEG

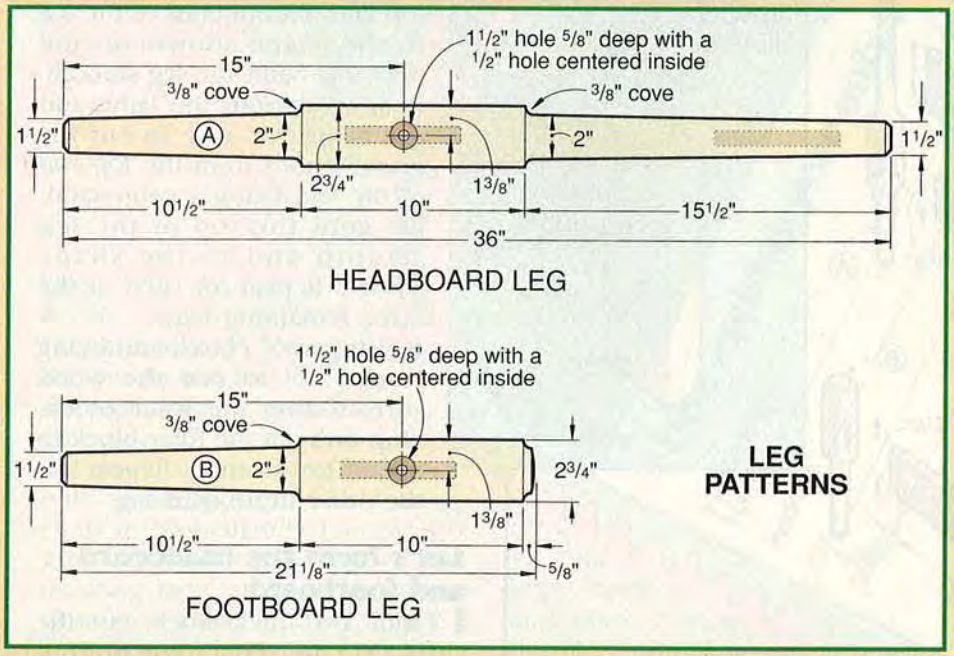
LEG SHOULDERS



V-BLOCK

Cut kerfs to act as reference marks and minimize chipping when turning.





LEG PATTERNS

drawing. Using hot-melt adhesive, firmly secure the filler blocks in place in their mating mortises. Filler blocks aren't needed for the areas left square (unturned) on all four legs.

2 Build a V-block jig for your miter gauge to the size shown on the V-block drawing, *top right*. Screw the jig to your miter gauge.

3 To act as reference kerfs and minimize chipping when turning, mark and cut eight 9⁄16"-deep kerfs in each leg where dimensioned on the Leg Shoulders drawing and as shown in the photo *above*. Notice here how we temporarily nailed a scrap of wood into the notched area to act as a stop.

4 Mark the centerpoints where shown on the Leg Patterns drawing at *left*, and bore a 1½" hole ⅝" deep in each leg where shown. Note that these holes are bored in the surfaces *opposite* the *side rail* mortises.

Turn the legs to shape

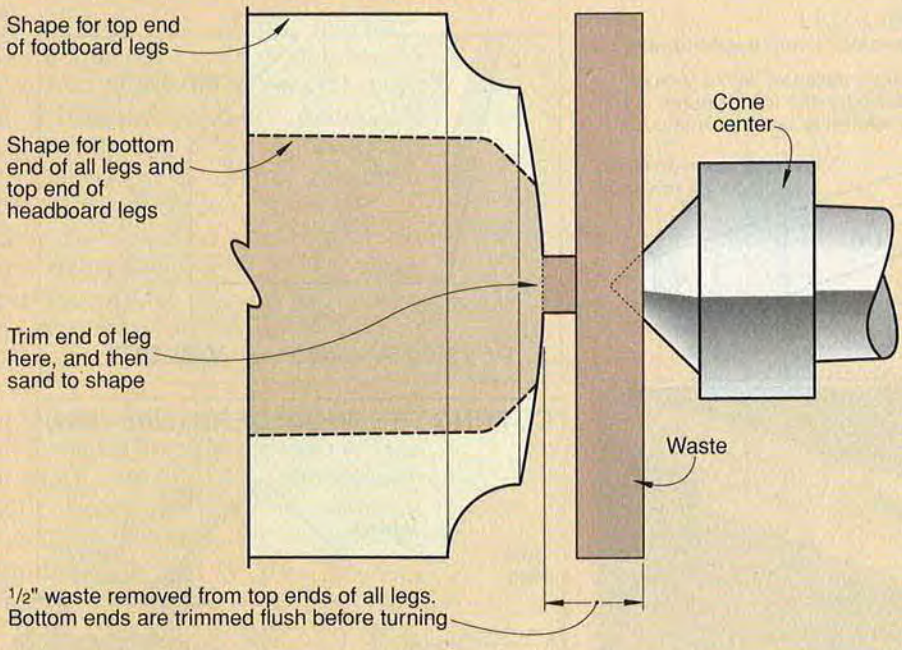
1 Mark diagonals on each end of each leg to find center. Then, mark the ½" waste on the *top end* of each leg.

2 Mount a leg between centers on your lathe, with the bottom end against the headstock spindle. See the Full-Sized End Pattern for reference. For symmetrical legs, it's critical to center the spur and cone centers on the marked centers on the ends of each leg.

Continued

SHAKER BED

Use a gouge to turn the cove where the leg taper meets the unturned portion.


Shape for top end of footboard legs
Shape for bottom end of all legs and top end of headboard legs
Trim end of leg here, and then sand to shape
Cone center
Waste
1/2" waste removed from top ends of all legs. Bottom ends are trimmed flush before turning

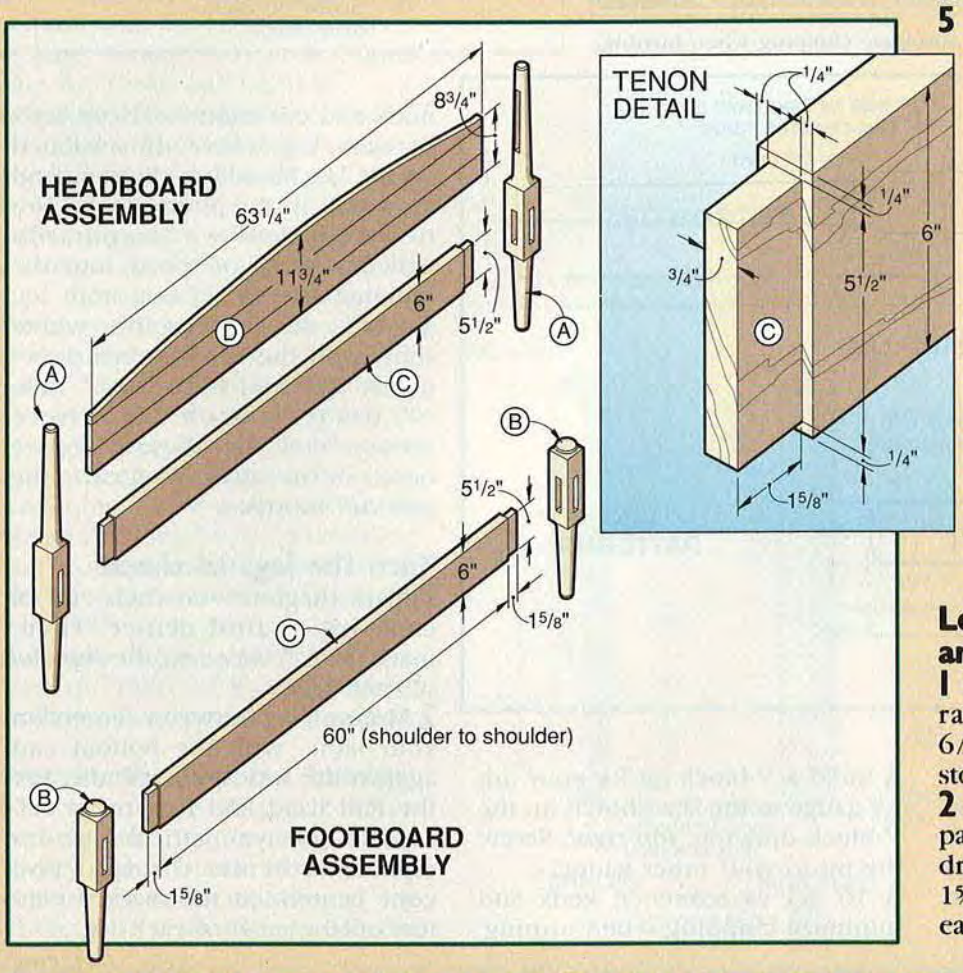
3 Using the dimensions on the Leg Patterns drawing on the *previous* page, turn each leg to shape. Remember, there's still a ½" of waste stock on the top ends of each leg. (We used a wide skew for the tapered portions and a ¼" gouge for the coved areas next to the kerfs as shown *above*.)

4 With the leg still mounted to your lathe, sand the turned areas smooth. Stop the lathe and sand with the grain to remove any cross-grained sanding marks.

5 Using the Full-Sized End patterns for reference, turn the top and bottom ends of the leg to the shape shown on the drawing. Sand the leg smooth. Remove it from the lathe and use a dovetail saw to cut the waste tenons from the *top end* of the leg. Using a palm sander, sand the top of the leg smooth and to the shape shown. Repeat for each of the three remaining legs.

6 Using a ½" chisel, and being careful not to mar the wood surrounding the filler block, chip away at the filler block to open the mortise. Repeat for the other headboard leg.

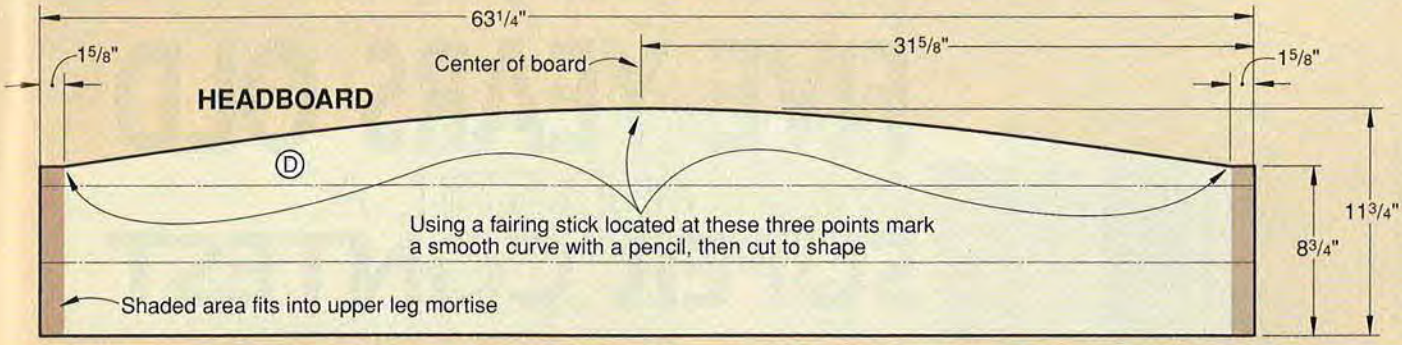
FULL-SIZED END PATTERNS



Let's form the headboard and footboard

1 From 1¼"-thick stock, cut the rails (C) to size. (We planed 6/4—referred to as six-quarter stock—to the stated thickness.)

2 Using the Tenon detail accompanying the Headboard Assembly drawing at *left* for reference, cut a 1⅝"-long tenon on each end of each rail (C).


63 1/4"
1 5/8"
Center of board
31 5/8"
1 5/8"
HEADBOARD
D
Using a fairing stick located at these three points mark a smooth curve with a pencil, then cut to shape
11 3/4"
8 3/4"
Shaded area fits into upper leg mortise

3 Edge-join enough ¾" stock to make the 11¾"-wide headboard (D). Scrape off the excess glue.

4 Plane or joint the bottom edge of the headboard blank. Then, trim both ends of the blank for a 63¼" overall length.

5 Lay out the arched top of the headboard using the Headboard drawing *above* for reference. (We first marked points for the arched top. Then, we cut a 3/16"-thick flexible strip of wood to the length of the headboard. Next, with a helper on hand to flex the strip over the marked points, we marked the arch.) Cut the headboard top to shape and sand smooth. Be careful not to sand the ends of the headboard to less than ¾" thick. Sanded less than ¾", the headboard will fit loosely into the headboard leg mortises.

6 Glue and clamp the headboard (D) and lower rail (C) between the headboard legs (A). (To keep the glue squeeze-out off the easily glue-stained cherry, we masked the wood surrounding the joints with masking tape. Use a damp cloth to immediately remove any glue squeeze out. Remove the masking tape, and use the damp cloth to remove any excess glue.)

7 Glue and clamp the remaining rail (C) between the footboard legs (B). Check for square.

8 Then, drill a ½" hole through each leg, centered inside each 1½" hole. You'll use these holes later for housing the bed bolts.

Cut and tenon the side rails

1 Cut the side rails (E) to size. Cut a tenon on each end of each rail to the size shown on the Tenon detail accompanying the Exploded View drawing.

2 Using the Mounting Bolt detail accompany the Exploded View drawing, mark the centerpoint, and bore a 1⅛" hole 1⅛" deep on the *inside face* of each side rail. To prevent boring through the side rail, you must use a flat-bottomed bit such as a Forstner.

3 Dry-clamp the side rails (E) into the leg mortises. Check for square. Using the previously drilled ½" holes in the legs as guides, chuck a brad-point bit into your portable drill, and quit drilling as soon as the bit bores into the ends of each side rail. Disassemble the pieces. Using a doweling jig to align the bit, continue drilling into the tenoned ends of the side rails until the bit reaches the 1⅛" nut-access hole. A brad-point bit will greatly diminish the chance of bit wander.

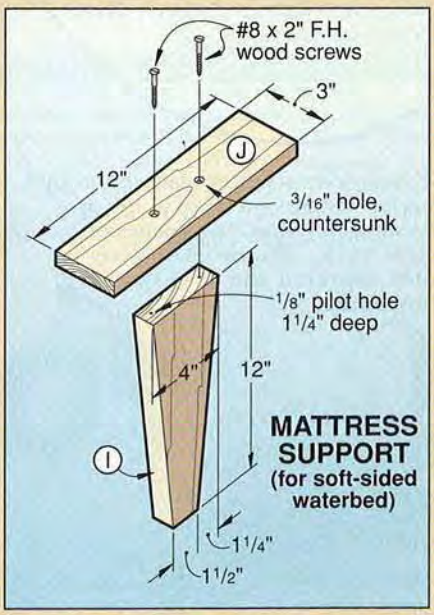
4 Reinstall the tenoned side rails (if removed to finish drilling the ½" bolt holes) into the mortised legs. Insert the mounting bolts, and place a square (not a hex-head) ½" nut inside the 1⅛" hole where shown in the Mounting Bolt detail accompanying the Exploded View drawing. Tighten the bolts until the bed frame is wobble free. See the Buying Guide for our source of hardware.

A sturdy platform plays a supporting role

1 Cut the platform cleats (F, G) to size. Drill countersunk 3/16" shank holes on 6" centers through the four cleats.

2 Screw the cleats to the inside faces and flush with the bottom edges of the end rails (C) and side rails (E).

3 Measure the opening, and cut the platform panels (H) to size from ¾" plywood. Cut a 1×1" notch in the corners adjacent to the legs where shown on the Exploded View drawing. Lower the panels onto the cleats to check the fit. They should fit without scraping the rails (C, E) when lowered into place.



Continued on page 78

Produced by Marlen Kemmet Project Design: James A. Downing
Photographs: Wm. Hopkins Illustrations: Kim Downing

Print this article

FIVE YEARS OLD AND STILL A SUPER CONTEST

Grand Prize winner William Perry, a home woodworker from Harmony, Pennsylvania, creatively crafted a five-layer face puzzle of oak, walnut, and cherry. His intriguing concept features interchangeable pieces so kids can build different faces, and even mix species.

Bright enthusiasm often diminishes with time, but not with *WOOD*® magazine's fifth annual Build-A-Toy® contest. More than 300 handcrafted toys made the February 1 deadline. See the array in the photo, *opposite page*. (Look closely, entrants, you might spot yours!)

In the student division, only Scott Robertson and his partner, Michael Lewis, both of Waltham, Massachusetts, were able to prevent a clean sweep by perennial champions from Newark, Ohio's Licking Valley High School. And home hobbyists topped the professionals by taking the Grand and First prizes. Yet, there were contest veterans among the winners, too. For a complete list of those who captured the prizes of trips and woodworking tools and supplies worth more than $16,000, see *page 84*. And look on *page 82* for the 1994 Build-A-Toy contest rules.

Toys from this year's contest will again be exhibited at Branson, Missouri's Silver Dollar City during its National Crafts Festival from September 15 to October 31. (Call 1/800/858-8258 for details about a special *WOOD* reader's money-saving package of second-day-free tickets to Silver Dollar City and discount coupons for motels and attractions.) Then, on December 14, comes the Crafted for Joy Toy Auction to benefit the U. S. Marine Corps Reserve's Toys-for-Tots program. Last year's auction, hosted by Louise Mandrell at Branson's Grand Palace Theater (also this year's auction site), raised more than $20,000 to cheer needy kids at Christmas. So a hearty thanks to you caring readers who crafted an entry in the Build-A-Toy contest, and the supporting advertisers. We hope you'll set aside time now to build your 1994 entry.

Expertly made of maple and walnut, the Cessna float plane entered by Petersburg, West Virginia hobbyist Larry J. Weaver captured First Prize overall.

▼ Neil Seely's walnut dachshund pull toy earned Second Prize in the professional division. The Rochester, New York, woodworker's toy also captured the Best Pull Toy award.

▲ The Third Prize among the pros went to Richard Williams of Winslow, Maine, for his workable log skidder (logs included).

▲ Home hobbyist James Weber, from Fayetteville, Ohio, rolled in with Second Prize in his division with his "Mr. Woodwrench" walnut race car.

▲ Surrounded by wooden toys, Build-A-Toy judges start their search for winners. From *right*, Capt. Scott Nisely, USMC; *WOOD*® magazine design editor Jim Downing; Iowa State University Extension education director Joy Rouse; Silver Dollar City master toymaker Doug Andrews.

▲ Home hobbyist Third Prize was awarded to Margaret Aldrich of Traverse City, Michigan, for her guaranteed-to-entertain puzzle game based on the Goldie Locks and the Three Bears theme.

▲ Jenny Linkous and Craig Sforza, both students at Licking Valley High School, Newark, Ohio, teamed up to take Second Prize in their division with an oak-and-walnut bulldozer.

▲ An all-oak ferry boat on wheels by more Licking Valley highschoolers, Byron Lewis and D.J. Weaver, caught the judge's attention for Third Prize in the student division.

Photographs: John Hetherington

What woodworkers need to know... ABOUT

Around 1750, woodworkers discovered screws, fasteners that had been used mainly by gunsmiths and clockmakers until then. Today, woodworkers everywhere rely on screws for strong, easy-to-make joints, or to fasten together parts that may require disassembly.

Print this article

First, a word about sizes

Here's how to decipher a screw size, such as #8×1¾". The first number denotes the gauge, or diameter, of the screw. A larger gauge number signifies a larger diameter, starting with #0 (just less than 1/16") and running to #24 (almost 3/8"), a rare size. You'll find #6 or #8 right for most work in ¾" stock; for extra strength, go to #10 screws (about 3/16" diameter) or larger.

The number following the gauge is simply the length. It's measured from the screw point to the widest part of the head.

When joining wood—piece A to piece B, say—we use a screw about 1⅔ times as long as the thickness of piece A (which should be the thinner piece if both aren't equal). So, if piece A is ¾" thick, use a 1¼" screw. To attach hardware to wood, we usually select a screw nearly as long as the wood is thick.

Pick from a slew of

Here's a look at some handy screws we frequently use in the *WOOD*® magazine shop.

Wood screws

These old standbys come in 140 sizes, from tiny #0×¼" up to #24×6". Such a variety of sizes, ready availability, and tradition make this the screw that most woodworkers grab for joinery and hardware attachment. But, the standard wood screw's shallow thread limits holding power, especially in end grain and in materials such as particleboard and plywood.

Most dealers stock wood screws of steel (often zinc-plated for rust resistance) and brass, in sizes up to #14 or #16. Slotted roundhead and flathead styles are most common. You must drill a pilot hole and a different-sized hole for the shank to drive a wood screw. (See chart, *opposite page.*)

Don't flip over heads

Once you determine which screw to use, you may have something else to consider: What kind of head do you want on it? The choice is already made for you with drywall or deck screws—the flat-topped *bugle head.*

We found a couple of styles for particleboard screws (the ones we used on the toybox on *page 35* cut their own countersinks via small nibs beneath the head), but each was in a different store. Shop around—what you get is the dealer's choice.

For woodscrews, choose between the familiar flathead and roundhead. A *flathead* countersinks into the wood to leave a surface with no protruding screw head. Use flatheads for mounting hardware with countersunk holes, too.

When you need extra holding power, turn to a *roundhead*; the flat underside can exert greater clamping force against a surface. Use this one, too, for hardware, especially with slotted-hole adjustable mountings.

An *ovalhead* tapers on the underside like a flathead, but rises to a slight dome on top. You'll find it atop some sheet-metal screws and brass wood screws.

We prefer ovalheads to flatheads for countersunk mounting holes in metal moldings and most hardware (except butt hinges). In these applications, ovalheads look neater because flatheads don't always fit flush with the hardware.

Pick a *panhead* sheet-metal screw when you want a flat surface on the bottom of the head. Use these where you would use roundhead wood screws. They're great for attaching hardware to thin stock.

When you have a choice, go for a Phillips or a square-recess head instead of a straight slot. Square-recess heads are the best of the lot. Not widely sold in hardware stores or home centers, square-recess screws are readily available by mail. McFeely's, P.O. Box 3, Lynchburg, VA 24505-0003, 800/443-7937, fax 804/847-7136, carries a large selection.

SCREWS

screws

Drywall screws

Once, only contractors bought these sharp-pointed screws, originally made to fasten gypsum wallboard to metal wall studs. Today, the black screws have become the general-purpose woodworking screw.

Available in #6 and #8 diameter and a variety of lengths, these hardened screws take hold with a thread nearly twice as deep as a same-sized wood screw. Threads may be coarse (about half as many threads per inch as a wood screw) or fine. The fine-thread one has two separate, parallel threads, so it's sometimes called a *twin-thread screw*.

You can drive drywall screws without drilling, but you're better off with a pilot hole. Without one, you may break the brittle screw when driving it into harder woods. And the screw's sharp point can split some woods.

Deck screws

Buy these instead of drywall screws for outdoor projects.

They resemble coarse-thread drywall screws, but have rust-resistant finishes. (We've found that the gray screws resist rust better than the gold ones.) Sizes range from #6×1" to #10×4½".

Deck and drywall screws serve well for joinery. But their head design doesn't work very well for attaching hinges and other hardware.

Particleboard screws

Particleboard and similar materials pose a special problem—screw threads often hog out a hole in the material instead of gripping it. But, with a thread slightly finer than that of a coarse drywall screw, the particleboard screw takes a deep bite without crumbling the material. A pilot hole isn't necessary, but a shank hole ensures a tight joint.

You can use particleboard screws in wood, too; they hold better than most screws in end grain. Dealers we checked with carry #8 and #9 particleboard screws in lengths from 1" to 3".

Sheet-metal screws

Though made for metalwork, these screws offer some advantages for woodworking.

The full-length thread engages more wood than does a wood screw of the same length. This makes the sheet-metal screw great for mounting hardware. And, there's just a pilot hole to drill.

Most dealers offer a wide selection of hardened sheet-metal screws, usually plated to resist rust. You'll find them made of stainless steel, too—your best bet for long-lasting outdoor projects.

PILOT AND SHANK HOLE SIZES

Pilot hole	WOOD SCREWS						DRYWALL, DECK & PARTICLEBOARD SCREWS				SHEET METAL SCREWS					
	#4	#6	#8	#10	#12	#14	#6	#8	#9	#10	#4	#6	#8	#10	#12	#14
Hardwood	5/64"	3/32"	7/64"	1/8"	9/64"	5/32"	5/64"	3/32"	3/32"	7/64"	1/16"	5/64"	7/64"	1/8"	9/64"	5/32"
Softwood	1/16"	5/64"	3/32"	7/64"	1/8"	9/64"	1/16"	5/64"	3/32"	3/32"	1/16"	5/64"	7/64"	1/8"	9/64"	5/32"
Shank hole	7/64"	7/64"	5/32"	3/16"	7/32"	1/4"	5/32"	3/16"	13/64"	7/32"	1/8"	9/64"	11/64"	13/64"	7/32"	1/4"

Make it easy on yourself

No soap. Don't lubricate screw threads with soap. Beeswax or paraffin works better, and you don't risk rust and discoloration.

Tap first for brass. Prevent breaking the heads off brass screws by driving in a steel screw of the same size first. The steel screw will cut threads for the softer brass screw.

Tightening tricks. Fully threaded screws won't pull parts together if you just drive them in. Either clamp the parts tightly or drill a thread-clearance hole through the top piece to prevent a gap.

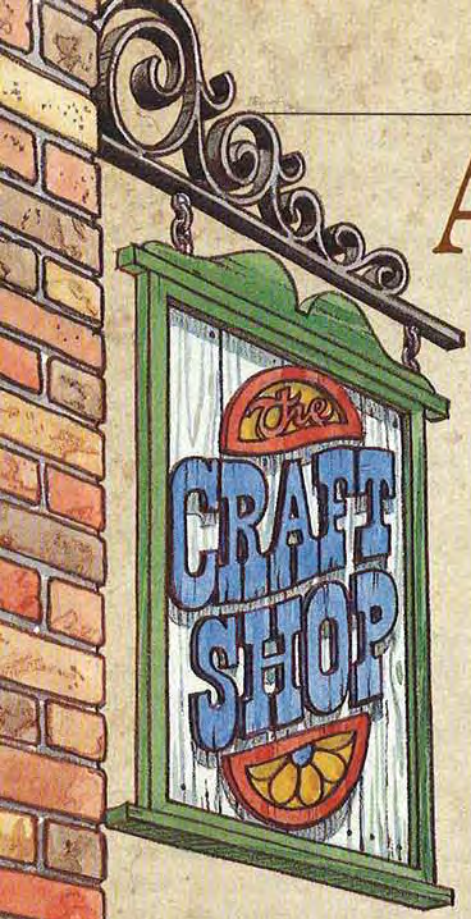
Right tip turns better. Make sure the tip of your screwdriver blade or power-driver bit fits the screw head snugly and is in good condition. Rounded corners on the straight blade or chewed-up wings on the Phillips point can spoil your project, and will certainly spoil your disposition.

Buy a bunch. Buy frequently used sizes by the box. For one thing, they're slightly cheaper that way. And you won't have to run to the store every time you need a couple. Buy drywall screws and deck screws by the pound. (Look for these screws in the bulk nail bins at the lumberyard.)

Illustrations: Kim Downing
Photograph: John Hetherington

AUTUMN LEAVES

Scrollsaw a fall fantasy for your wall



Putting together our wreath of scrollsawed fall foliage is almost as much fun as jumping into a pile of autumn leaves! What's more, the colors of the season will warm your home all season long.

Print this article

Refer to the chart of blank sizes *below right*, and cut four blanks for each part letter. (For stock, we resawed ¾" pine to ¼" thick.)

Photocopy the five full-sized leaf patterns, and trace each to its corresponding set of blanks. Note the grain direction.

Drill blade start holes where shown for leaves A and B. Cut all parts A, parts B, and so on. Begin with the inside cuts. Then, cut the outside to shape. (We used a #5 blade, .038×.016" with 12.5 teeth per inch for all sawing.)

Because the knob on the stem of part C fits into the notch on part A, cut both carefully. The most fragile part of the cutting comes at the point where the two stems cross on part D.

Sand all parts. Following label instructions, color the leaves with Delta's Home Decor gel wood stains and pickling gels, available in craft shops. Use the colors indicated on the patterns or your own. (Washes of thinned acrylic artist's colors also work.)

To begin assembly, draw diagonal lines to locate the center on a 20" square of cardboard or heavy paper. Draw one circle 18" in diameter (9" radius) and one 2½" (1¼" radius) around the center. Lay waxed paper on the cardboard so you don't glue the wreath to it.

Glue parts A and B together. Then, place part C inside the arc, fitting the stem into the notch on part A, where shown in the detail drawing. Adjust as necessary, and glue. Complete the four assemblies, and arrange them on the cardboard as shown in Step 1 of the assembly drawings.

Place parts D in position as shown in Step 2. Adjust as necessary, lightly mark the overlap on parts A, B, and C, and then glue parts D into place. After the glue dries, glue a part E to the back of each part D (Step 3).

Let the glue dry thoroughly, and spray on clear polyurethane. Attach a hanger to the back.

Buying guide

Patterns. For information about other designs, send a SASE to Susan Evarts, 115 Kensington Ave. No. 8, Meriden, CT 06450. Please, no telephone requests.

Blanks	
Part	**Dimensions**
A	¼×3½×5½"
B	¼×3½×4½"
C, E	¼×3×4"
D	¼×4½×7½"

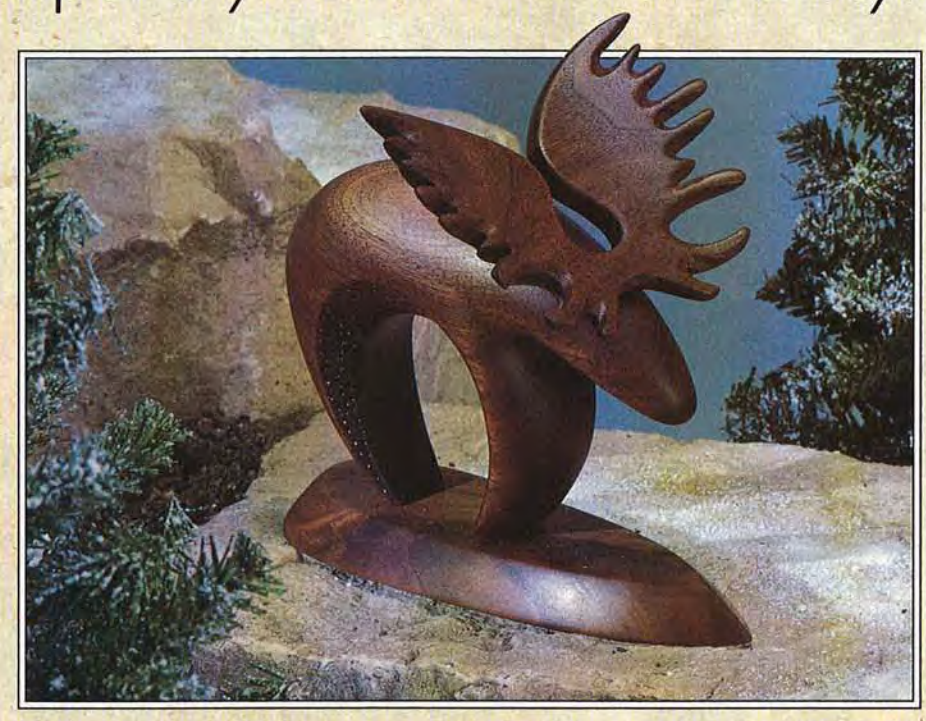
Project Design: ©Susan Evarts
Illustrations: Mike Henry
Photograph: John Hetherington

Continued on page 80

GENTLE GIANT

A contemporary look in a native style

"They are so powerful, yet so gentle," says designer Kim Russell, explaining her fondness for the moose. Inspired by Native American themes, she captured that spirit in this design that you can cut and sand to shape easily.



You'll need *walnut or other hardwood 1¾ × 4 × 6" for the moose body, a piece ¾ × 3½ × 4½" for the antlers, and one that's ½ × 2½ × 8" for the base.*

Photocopy the full-sized patterns. Trace the body side view, antlers, and base patterns onto their corresponding pieces of stock.

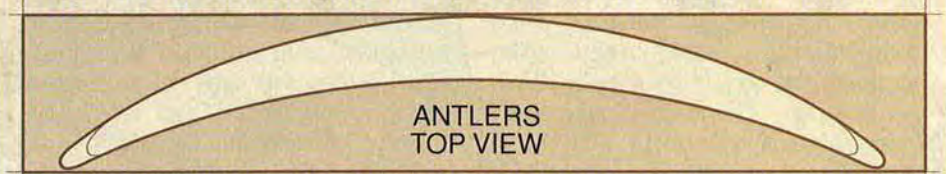
On the body, drill a ⅜" hole where shown. Then, bandsaw the inside leg curve (Cut 1) with a ¼" blade. Complete the cutting sequence shown on the pattern.

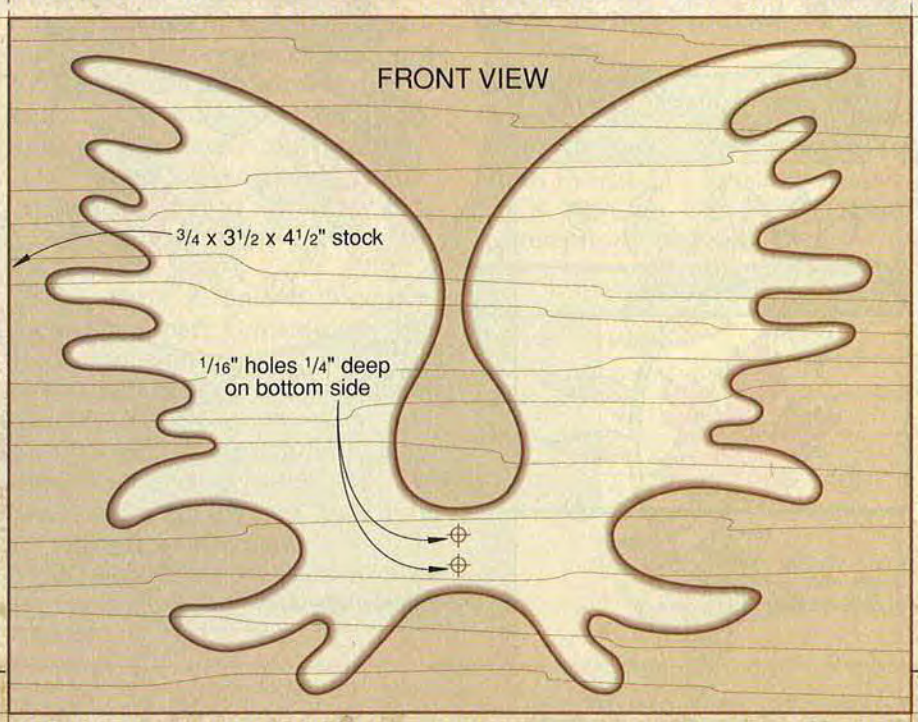
Mark a centerline along the sawed top edge, and then sketch the top-view outline onto the blank. On the bottom, draw the ¾"-wide arcs where shown by the Foot Placement lines.

Now, with a stationary belt sander and an 80-grit belt, sand to the top-view outline. Taper the sides to ¾" wide at the feet. Drum-sand the inside leg curve.

Next, draw two parallel lines along the inside curve between the front and back feet. Then, start at the top of the curve with a file or long sanding drum and form the 45° bevel from the line to the side of the body on each side.

With belt and drum sanders, round the front of the front leg, the underside of the head, and the curve from the nose to the hind foot. Sand the feet flat.





OF THE WOODS

Finish-sand the body. Clamp it in a vise (pad the jaws to protect the wood), and dimple the beveled areas with a centerpunch.

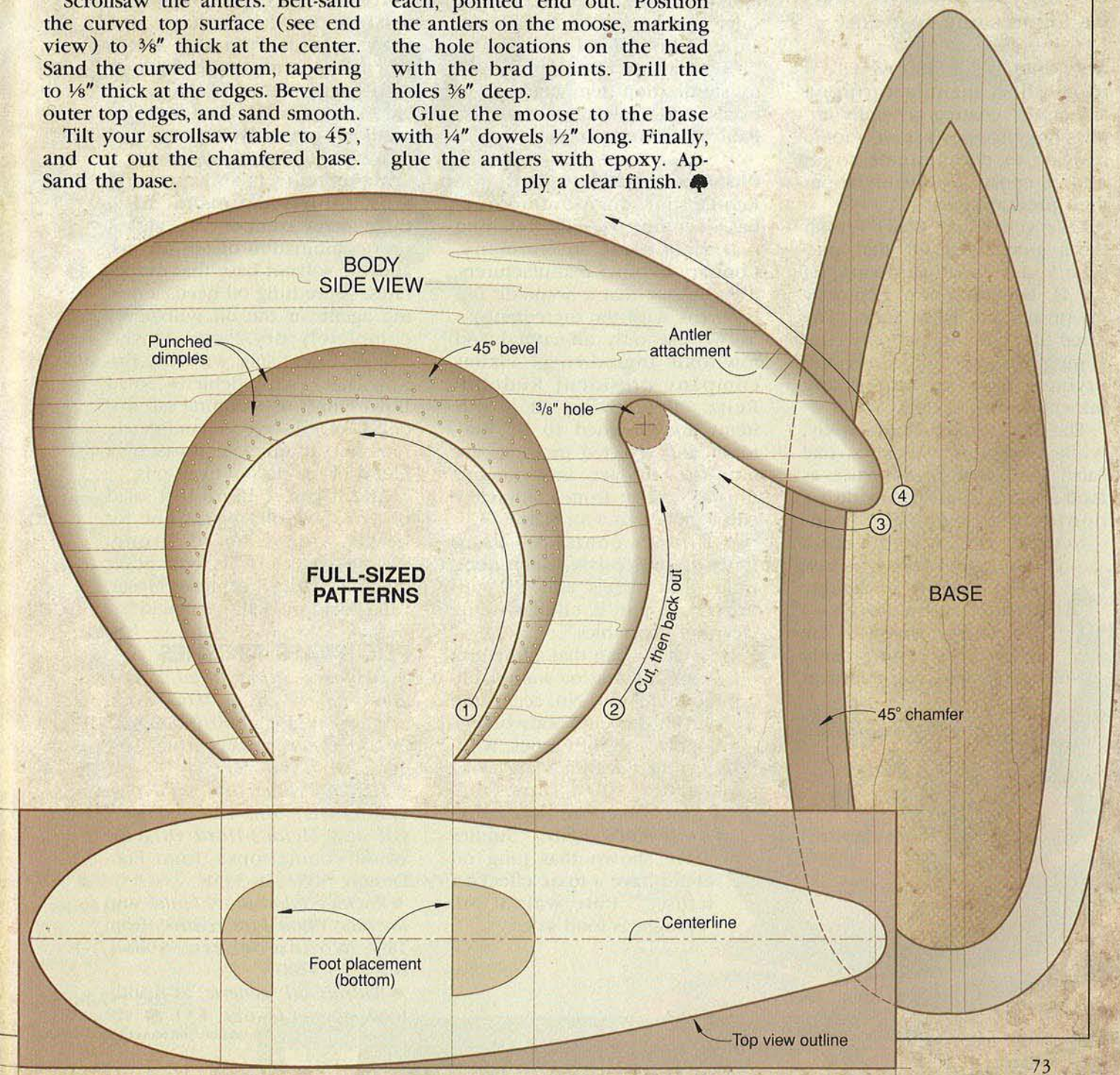
Scrollsaw the antlers. Belt-sand the curved top surface (see end view) to ⅜" thick at the center. Sand the curved bottom, tapering to ⅛" thick at the edges. Bevel the outer top edges, and sand smooth.

Tilt your scrollsaw table to 45°, and cut out the chamfered base. Sand the base.

Drill two 1/16" holes ¼" deep where shown on the antlers. Epoxy-glue a ½" piece cut from the pointed end of a #16 brad into each, pointed end out. Position the antlers on the moose, marking the hole locations on the head with the brad points. Drill the holes ⅜" deep.

Glue the moose to the base with ¼" dowels ½" long. Finally, glue the antlers with epoxy. Apply a clear finish.

Project Design: ©Kim Russell
Illustrations: Mike Henry; Kim Downing
Photograph: John Hetherington



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HERE'S THE SCOOP ON FOOD-SAFE FINISHES

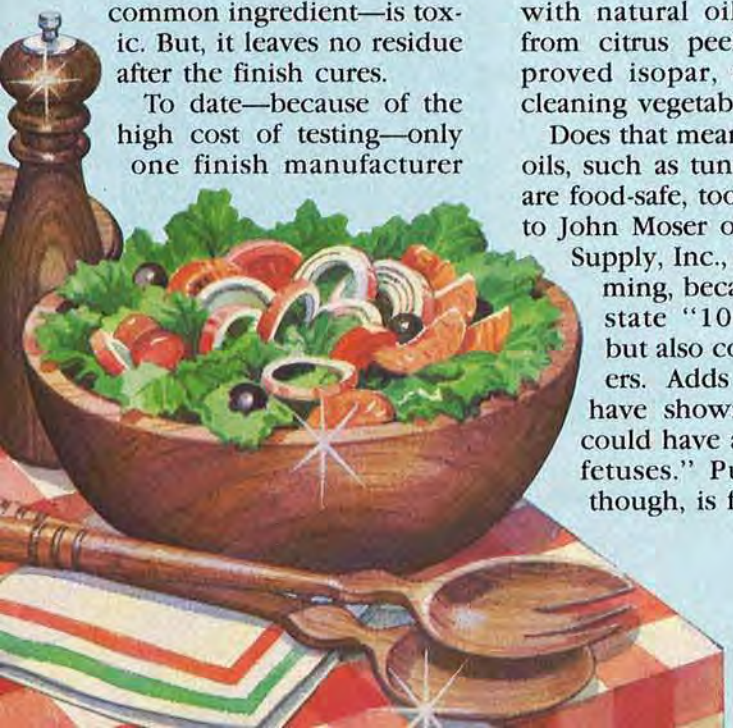
That bowl you just turned would be super for salad, or even ice cream. But what finish can you trust for food? In talking with manufacturers, we found some answers.

According to the folks we talked to in finish manufacturing, a "food-safe" coating generally implies one that won't leave a toxic residue to contaminate food. And all spoke confidently about their product lines.

"We sell Salad Bowl Finish that's guaranteed for that purpose," says Jonathan Kemp, of the H. Behlen & Bro. company in Amsterdam, New York. "The dried film is nontoxic, only containing natural, edible oils and drying salts in an evaporating mineral-spirits solvent."

The fact is, manufacturers say, while only a few finishes, like Salad Bowl Finish, advertise as food-safe, most finishes made are nontoxic when dry. For instance, mineral spirits—a common ingredient—is toxic. But, it leaves no residue after the finish cures.

To date—because of the high cost of testing—only one finish manufacturer has approval from the Federal Food and Drug Administration (FDA). That's Torgenal, Inc., of Sheboygan Falls, Wisconsin, which produces 100 Clear, an epoxy coating that when dry results in a rock-hard finish considered completely food-safe. "100 Clear has FDA approval up to sterilization temperatures in excess of 150 degrees," says Lisa Paul, marketing director.



Nontoxic, edible oils

Eco-Design, an Albuquerque-based company, sells finishing materials made in Germany. Contrary to other manufacturers, they believe that a nontoxic finish starts with the ingredients.

"We use only all-natural and low-toxic ingredients," claims company president Rudolph Reitz. "Essentially, all of our items are designed to be low-toxic, and selected products are food-safe. In fact, most of our finishes derive from completely edible materials. Our Natural Citrus Thinner contains—along with natural oils—d-lemonene from citrus peels and FDA-approved isopar, a chemical for cleaning vegetables."

Does that mean that all natural oils, such as tung or walnut oil, are food-safe, too? No, according to John Moser of Woodworker's Supply, Inc., of Casper, Wyoming, because a label may state "100% Tung Oil," but also contain toxic dryers. Adds Reitz, "Studies have shown that tung oil could have a toxic effect on fetuses." Pure walnut oil, though, is food safe.

Ask for an MSDS

If you aren't sure what a finishing product contains, you can ask the company that makes it (or the retailer) to give you a material safety data sheet (MSDS). The law requires that they comply. On the MSDS you'll find every ingredient, including toxic components. "Most of those so-called toxic ingredients are solvents and will evaporate," Moser notes.

Manufacturers indicate that most oil-based finishes have three main components: an oil or a combination of oils, dryers, and the solvent base that evaporates. "Pure tung oil needs a drying agent, or the oil will never completely dry," says Moser. "Those driers stay with the finish. That's why Behlen's Salad Bowl Finish uses natural salt driers. Our Preserve, a completely food-safe product, consists of a blend of exotic nut-meat oils."

And if you've heard that salad oil (or olive oil) works fine for bowls, you've heard wrong. "Those types of oils will never completely dry," cautions Moser, "and salad oil will go rancid."

FOOD-SAFE FINISHES

- *Behlen's Salad Bowl Finish* and *Preserve*, from Woodworker's Supply, Inc., 800/645-9292.
- *100 Clear Epoxy*, from Torgenal, 800/558-7596.
- *Herbal Primer and Oil Finish* (for bowls) and *Dubno-Primer Oil* and *Meldos-Hard Oil* (for wood countertops), from Eco-Design, 505/438-3448.
- *Rockler Salad Bowl Finish* and *Rockler Wood Preservative*, from The Woodworkers' Store, 612/428-3200.
- *Walnut oil, generic,* at health-food stores (16 ozs., $3).

Illustration: Jim Stevenson

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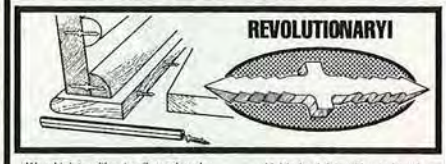

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PERFECT PACHYDERM

Continued from page 51

Natural-habitat base

To build a base like the one Bob made, transfer the base outline to ⅞"-thick walnut. Bandsaw to shape and rout the top edge with a Roman ogee.

Draw a line on the top face ¼" inside the Roman ogee edge. Carefully rout the area inside the line 3⁄16" deep. The bottom of the recess doesn't need to be smooth (The rotary carving tool does this job well.) Finish the base. (Bob uses Deft lacquer.) When the finish dries, mask the edge to protect it through the next steps.

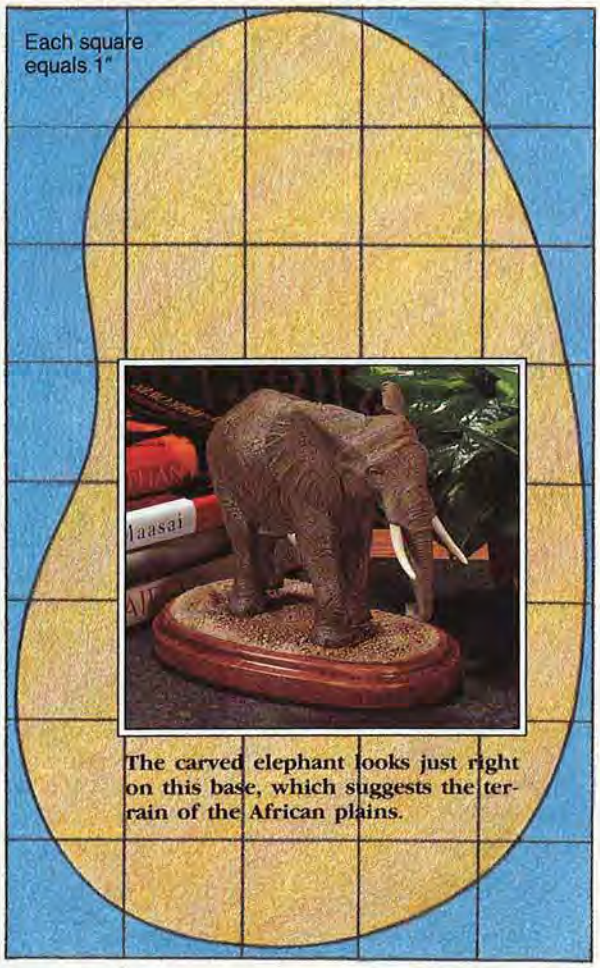
Mix Durham's Rock Hard Water Putty (available at hardware stores and home centers) to the consistency of heavy cream. Pour the mixture into the routed recess on the base and level it with the base edges.

Quickly mix another batch of putty, using little water. This should be crumbly, like damp sand. Sprinkle it on the wet base and let set for 10–20 minutes.

Lightly press the elephant's feet into the stiffened putty to make slight footprints. Remove the elephant, and set the base aside to dry for a day or so.

When dry, drill a ⅛" hole through the base in the center of each footprint. Countersink the holes on the bottom.

Paint with a wash of thinned deep green in some areas, thinned raw umber in the rest. Dry-brush with mixed raw umber and raw sienna, followed by yellow ocher, and then white. When dry, remove the masking tape, and mount the elephant with a screw into each foot.



The carved elephant looks just right on this base, which suggests the terrain of the African plains.

BASE
Enlarge gridded base drawing on a photocopying machine set at 140 percent

Project Design:
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Written By: Larry Johnston
Photographs:
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Illustrations: Jim Stevenson

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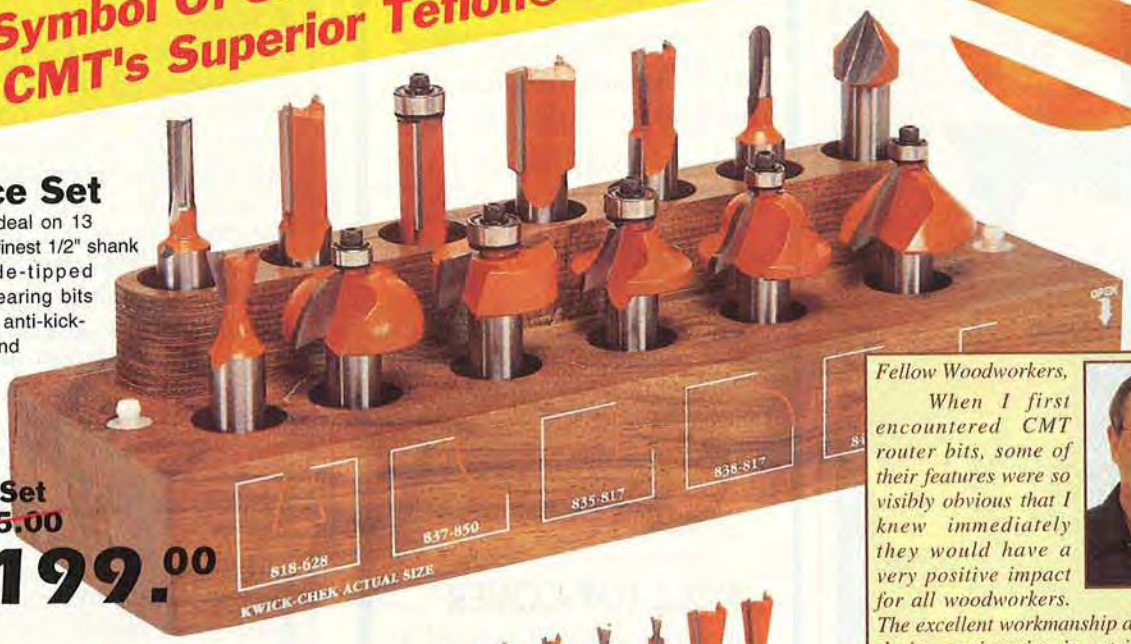

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Patrick Spielman, Author
Router Basics, Router Handbook, Router Jigs and Techniques

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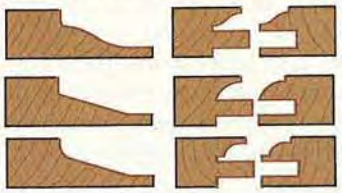

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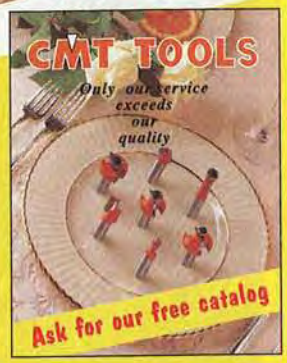

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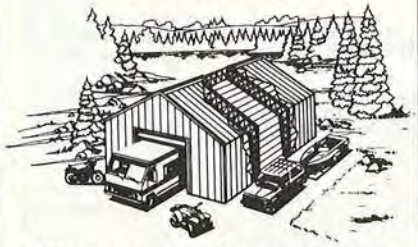

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SHAKER BED

Continued from page 65

4 If you use the soft-side waterbed mattress described *below*, you'll need an additional support between the plywood platform panels. To form the support, cut and join the pieces I and J as shown on the Mattress Support drawing. Later, you'll position and secure the support under the plywood panels where shown on the Exploded View drawing and accompanying Support detail.

Finally, the finish

1 Disassemble the bed and finish-sand all the pieces.

2 Finish as desired. (We applied two coats of gloss and one coat of satin Minwax fast-drying polyurethane.) Reassemble and nail the decorative covers centered over the 1½" holes in the legs.

Mattress options

You have several options for mattresses with this queen-sized bed frame. First, simply place a standard mattress directly on the plywood platform. Or, place a box spring and mattress directly on the platform (we prefer not to include the box spring). This makes the top of the mattress about 27" off the floor. High mattress heights are common in many country decor's, but less common in Shaker room settings.

You also can place a soft-side waterbed mattress on the platform. This mattress type weighs less than a standard waterbed mattress, and feels more like a regular spring one. Too, the soft-side mattress doesn't require a heater and has side-independent adjustable firmness.

Buying Guide

• **Shaker bed hardware kit.** Four 1¾" antique English bed bolt covers, JG-226, and four French bed bolts, JG-416. Stock no. WMBD-KIT, $23 ppd. Farmerstown Hardware and Supplies, 3155 State Route 557, Baltic, OH 43804. Or call 216/893-2464 to order.

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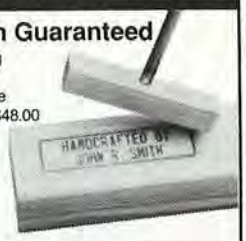

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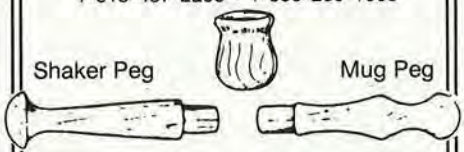

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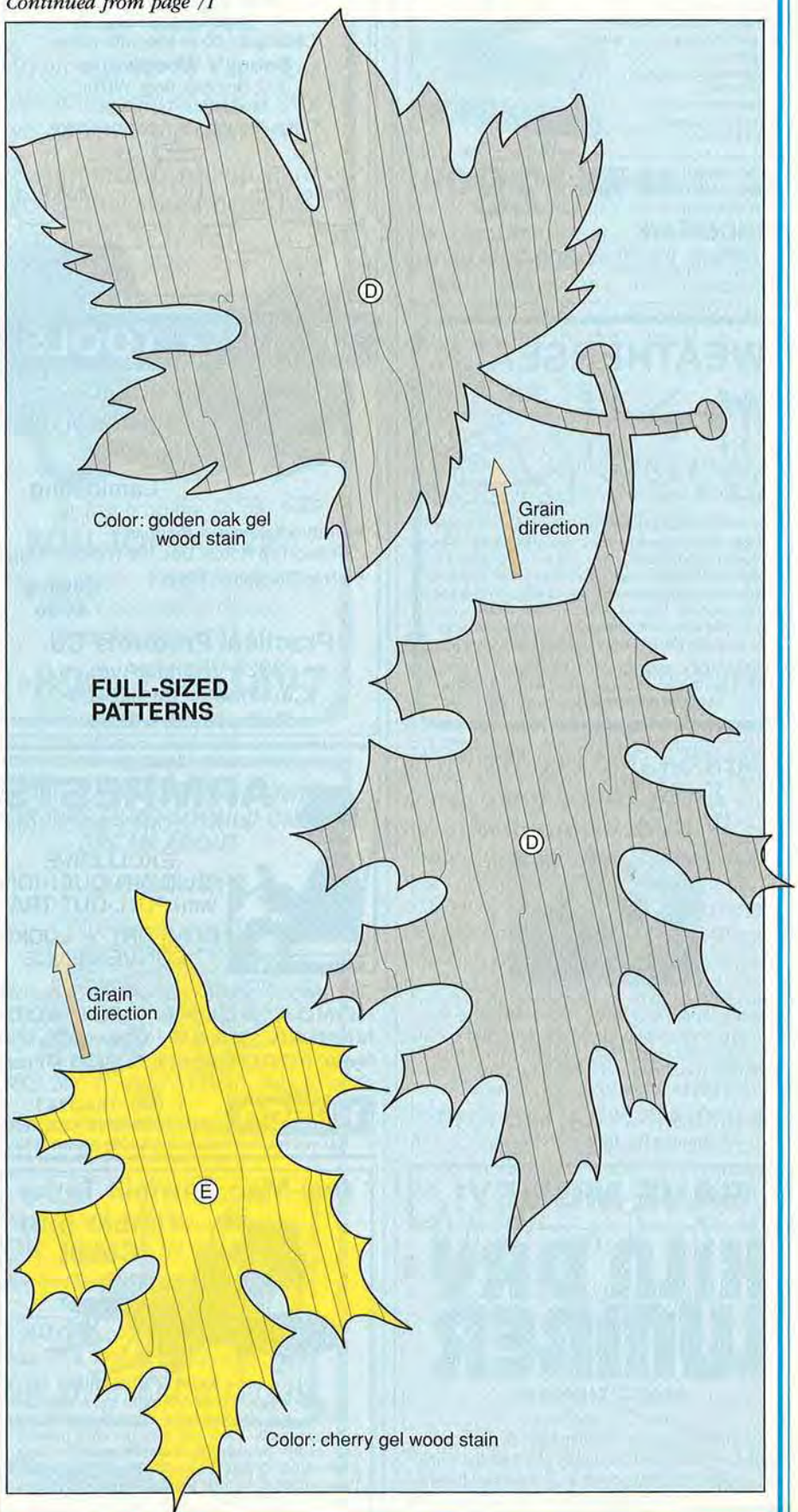
AUTUMN LEAVES

Continued from page 71



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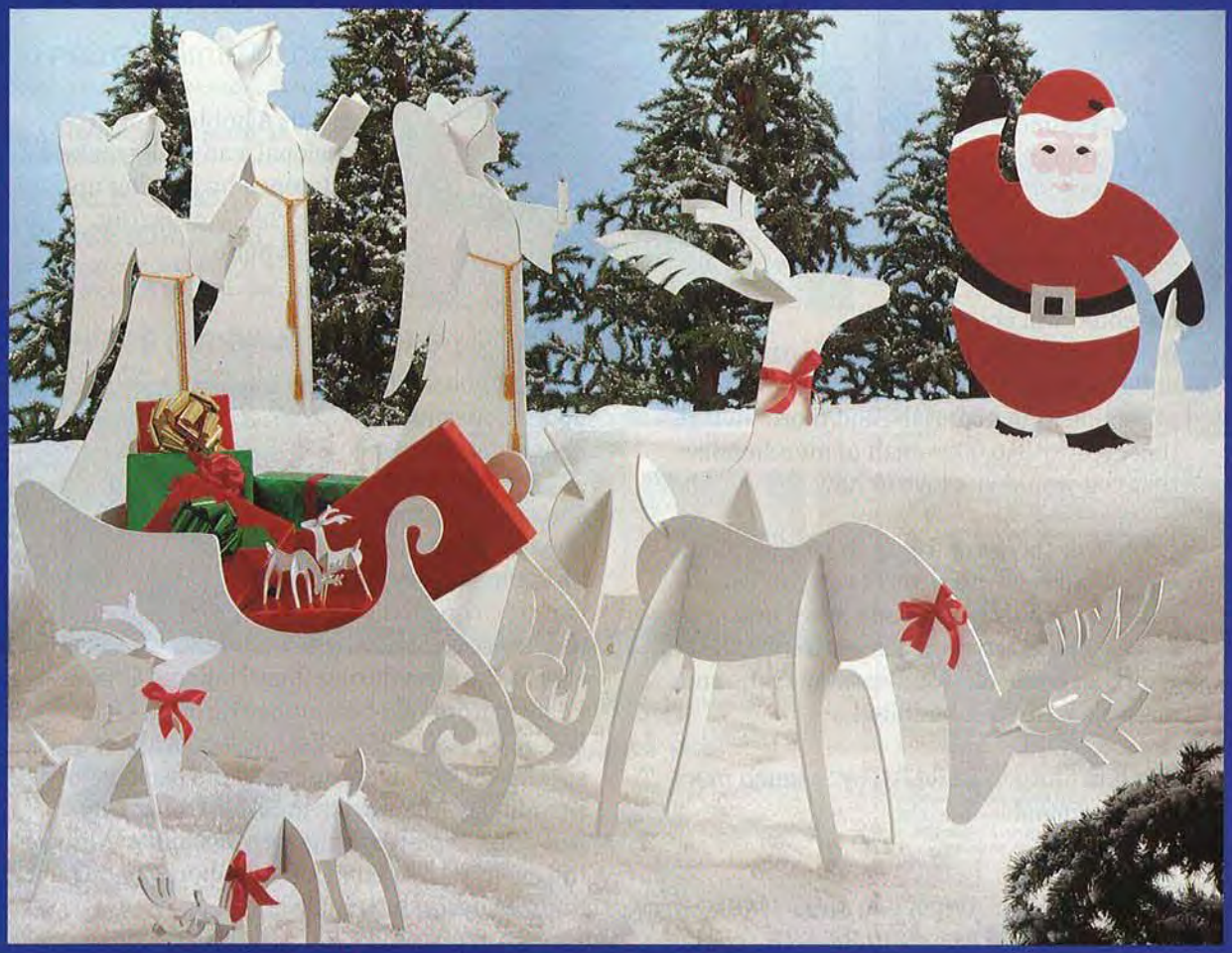

PLAN 1–SANTA
(4'Height)

PLAN 2–REINDEER
(3'W x 4'H)

PLAN 3–SMALL REINDEER
(med. 28" Height, Sm. 9" Height)

PLAN 4–SLEIGH
(56"L x 35" H)

PLAN 5–ANGELS
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Everyone wins in this contest because all toys go to help needy kids at Christmas. And that gives you a great feeling. Of course, your toy could win you one or more dandy prizes, too—brand–name portable and stationary power tools, woodworking supplies, finishing materials, and more. In fact, there's over $16,000 worth of merchandise that you would just love to have in your shop!

Look over the prize list on the facing page. Check out how many ways you can win—either as a hobbyist woodworker or a professional. There are even categories for a group effort, so come on woodworking clubs and shop classes, start building!

But don't forget, Build-A-Toy is much more than a contest.

CRAFT A TOY FOR JOY

When you enter *WOOD* magazine's Build-A-Toy contest, you automatically contribute to the U.S. Marine Corps Reserve's caring program, Toys for Tots. You'll receive a commemorative "I Crafted a Toy for Joy" sticker to prove it . That's because all hand-crafted entries are sold at auction to raise money for the Marines to buy many, many more toys. Last year, at the magnificent Grand Palace Theater in Branson, Missouri, Build-A-Toy entries at the Crafted for Joy toy auction raised over $20,000 to purchase gifts for less-fortunate children at Christmas! That proves that you, as a hobbyist or professional, can really make a difference by lighting up some child's eyes. But there's more.

WOODEN TOYS ON DISPLAY

So that thousands upon thousands of people can appreciate the craftsmanship and care that goes into building a toy-contest entry, your toys go on display at Silver Dollar City at Branson during their National Crafts Festival from mid-September through October. (Call 1-800/858-8258 for details about a special *WOOD* magazine reader's package of second-day-free tickets to Silver Dollar City and other money-saving area discounts during the event.) Then comes December, a happy time for deserving children.

TOYS FOR TOTS, BY YOU!

Weeks before Christmas, the toys you entered in the Build-A-Toy contest go up for auction at Branson's Grand Palace Theater. What excitement there is! One-of-a-kind wooden toys sell for up to hundreds of dollars each as eager bidders vie for the examples of your craftsmanship. And if your entry brings $100 or more, we'll let you know with a personal letter that you can display with pride.

So set aside time right now to plan and build your entry. Read the rules and guidelines shown at right. Get your entry in by February 1, 1994, and then proudly say, "I CRAFTED A TOY FOR JOY!"

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FIRST PLACE (ORIGINAL DESIGN)

Professional: Your choice of $1,500 in Delta power tools
Hobbyist: Your choice of $1,500 in Delta power tools

SECOND PLACE (ORIGINAL DESIGN)

Professional: From AMI, a Hegner Multimax scrollsaw worth $1000
Hobbyist: A shopful of Craftsman benchtop power tools worth $1000

THIRD PLACE (ORIGINAL DESIGN)

Professional: Your choice of Skil power tools totaling $500
Hobbyist: Your choice of Skil power tools totaling $500

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Hobbyist: $250 in Formby's finishing supplies
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Professional: $250 in Formby's finishing supplies
Hobbyist: Campbell Hausfeld HVLP sprayer
Best Action Toy
Professional: $250 in Dremel tools
Hobbyist: $250 in Dremel tools
Best Painted or Dyed Finish
Professional: $250 in Trend-Lines merchandise
Hobbyist: $250 in merchandise, The Woodworkers' Store

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Professional: $250 in merchandise, Meisel Hardware Specialties
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Professional: $250 in Dremel tools
Hobbyist: $250 in Dremel tools
Best Transportation Toy
Professional: $250 in Crafts Supplies USA merchandise
Hobbyist: $250 in Toys-N-Joys merchandise

1994 RULES

1. Projects must fit into a box no larger than 2' x 2' x 2'. The primary material should be wood but may incorporate other materials.
2. Please follow Consumer Product Safety Commission guidelines: nontoxic wood finishes only; no parts smaller than 1 1/4" square on toys for children under three years of age; no sharp corners or points; pull strings longer than 12" should not have beads or other attachments that could tangle and form a loop.
3. Entries must be received by February 1, 1994. All entries must be postpaid; collect entries will be refused. Attach an entry label, photocopy of an entry label or a 3 1/2" x 5" card with your name and address to each toy.
4. Woodworkers who build toys from existing plans will be eligible for Citation prizes only. Woodworkers who build their own original designs will be eligible for all prizes.
5. Entry constitutes permission to use winner's name, hometown and photograph for promotional purposes. Employees and family members of Meredith Corporation, their affiliates and subsidiaries are ineligible. Void in Quebec.
6. Winners will be selected and notified by mail on or about April 15, 1994, and will receive the prize directly from the manufacturer /distributor. For a list of winners, send a separate, self-addressed stamped envelope to BUILD-A-TOY, 1912 Grand Avenue, Des Moines, IA 50309-3379.
7. Meredith Corporation will donate all entries or auction money received from entries to the U.S. Marine Corps Reserve Toys for Tots program.
8. **For woodworkers who enter their toy as an original design:** Toy must be your own original design. A different approach to an existing toy would qualify. Please do not enter toys with only subtle changes from published patterns.
9. A panel of representatives from the U.S. Marine Corps Reserve, Meredith Corporation and woodworking experts will judge the toys on child's appeal, craftsmanship, originality, and durability. The panel's decision will be final.
10. Professional woodworkers include woodworking teachers and anyone earning income by selling wooden items.

SPECIAL AWARDS

Best Toy from a Woodworking Club
$250 in Leichtung merchandise; Milwaukee Tool $500 miter saw

Best Toy from a Shop Class
$250 in Delta tools; $250 in 3-M supplies

WOOD® Magazine's 1994 BUILD-A-TOY™ Competition

WOOD® Magazine's 1994 BUILD-A-TOY™ Competition

There is no limit to the number of entries. Please provide the following information for each toy submitted.

My entry is: ❑ Original design* ❑ Built from plans

My skill level is ❑ Student (K-12) ❑ Home Hobbyist ❑ Professional

My Affiliation: ❑ WW Club ❑ Shop Class

*For Original Design entries: I certify that I have designed and built this toy myself. Should my entry win, I agree to cooperate with WOOD Magazine to supply builder's notes and a bill of materials for publication.

Signature_____

Date_____

Name_____

Address_____

City_____

State_____ ZIP_____

Phone (_____)_____

Send toys to : 1994 BUILD-A-TOY, WOOD Magazine, 1912 Grand Avenue, Des Moines, IA 50309-3379

1994 BUILD-A-TOY ENTRY DEADLINE: FEBRUARY 1, 1994

HERE ARE THE CHAMPS

From trucks and trains to dinosaurs and doggies, here's the complete list of what entry took what in the 1993 edition of *WOOD®* magazine's annual Build-A-Toy® contest (see photos of the top winners' projects on *pages 66-67*).

Best Use of Wood in the home-hobbyist division went to Roger Zack for his walnut and maple Ford pickup truck.

GRAND PRIZE (Expense-paid vacation for family of four at Silver Dollar City, Mo.): William T. Perry, Harmony, Pa., face puzzle.

FIRST PRIZE (A day at *WOOD®* magazine's IDEA SHOP™): Larry J. Weaver, Petersburg, W.Va., float plane.

STUDENT DIVISION

Second Prize ($1,000 in Delta merchandise): Jenny Linkous/Craig Sforza, Newark, Ohio, bulldozer.

Third Prize ($1,500 in RBI merchandise): Bryon Lewis/D.J. Weaver, Newark, Ohio, ferryboat.

Best Use of Wood ($100 in Constantine merchandise): Jenny Linkous/Craig Sforza, Newark, Ohio, bulldozer.

Best Finish ($200 in Behlen merchandise): Jason Smith/Nathan Wright, Newark, Ohio, bank tractor and wagon.

Greatest Number of Toys Entered ($250 in Leichtung merchandise): Licking Valley High School, Newark, Ohio, wagons.

Best Transportation Toy ($500 in Skil merchandise): Scott Robertson/Michael Lewis, Waltham, Mass., riding tow truck.

Best Pull Toy (ELU router, Tool Crib of the North): Chris Peffers, Newark, Ohio, maple-wheeled wagon.

HOME-HOBBYIST DIVISION

Second Prize ($1,500 in Trendlines merchandise): James Weber, Fayetteville, Ohio, race car.

Third Prize ($1,500 in Delta merchandise): Margaret Aldrich, Traverse City, Mich., three bears puzzle.

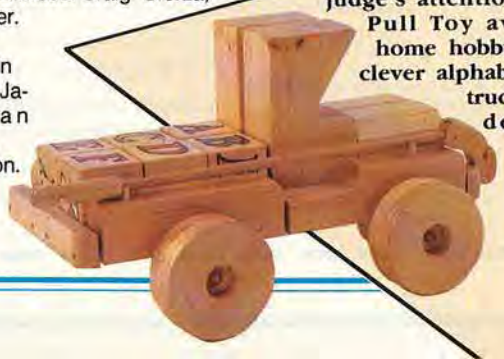
Best Use of Wood ($1,500 in Craftsmans Corner merchandise): Roger Zack, Bloomington, Minn., Ford pickup truck.

Best Finish ($300 in Behlen merchandise): William Trumble, Grants Pass, Oreg., colorful vintage truck.

Greatest Number of Toys Entered ($1,000 in Porter Cable merchandise): Robert Sylvain, Granby, Conn., action folk toys.

Best Transportation Toy ($1,000 in Vermont American merchandise): tie shares prize, George Cole, Sequim, Wash., jalopy car, and Don L'Hoste, Kenner, La., merry-go-round airplane ride.

Best Pull Toy ($500 in Meisel Hardware merchandise): Joseph Young, Massapequa, N.Y., alphabet-blocks truck.



Joseph Young caught the judge's attention and a Best Pull Toy award among home hobbyists with his clever alphabet-block pine truck. The handle detaches for hanging on the truck.

Built from a *WOOD* magazine design, this truck by students Scott Robertson and Michael Lewis earned Best Transportation Toy.

PROFESSIONAL DIVISION

Second Prize ($1,500 in Eagle America merchandise): Neil Selly, Rochester, N.Y., dachshund pull toy.

Third Prize ($1,000 in Atlas Copco merchandise): Richard T. Williams, Winslow, Maine, log skidder.

Jay Wye's whimsical, colorfully painted, crayon-carrying dinosaur captured a Best Finish award in the pro division. It's also a great pull toy.

Best Use of Wood ($1,500 in Dremel merchandise): Henry J. Gorczynski, Batavia, N.Y., trolley.

Best Finish ($500 in Behlen merchandise): Jay Wye, Amesbury, Mass., dinosaur crayon carrier.

Greatest Number of Toys Entered ($250 in Econ-Abrasives merchandise): Steve Forrest, Sunrise, Fla., tic-tac-toe sets.

Best Transportation Toy ($1,000 in clamps from American Tool Co.): David Geist, Pocono Lake, Pa., zoo train.

Best Pull Toy ($500 in Sears Craftsman merchandise): Neil Seely, Rochester, N.Y., dachshund pull toy.

Photographs: John Hetherington

Print this article

PRODUCTS THAT PERFORM

This simple, affordable stop ensures accurate cutoffs

Every woodworker with a radial-arm saw, or mitersaw mounted in a stand, should have a stop system for cutting multiple workpieces to exactly the same length. You can make your own stop from a few scraps of wood, some simple hardware, and an adhesive-backed measuring tape. But why do it when you can buy the Sure Set Saw Gage for less than $30? This product works great and should last a lifetime.

Before mounting the Sure Set to my radial-arm saw, I had to make a fence that stands 1½" above the table of the saw to accommodate the height of the stop. Once in place, the simple device worked without a hitch. It has a large knob for tightening it into place, and fine-adjustment screws on both sides. This allows you to use the stop on either side of the blade. The product comes with a self-adhesive-backed, 48" measuring tape that you can mount to the left or right of the blade.

—Tested by Bob McFarlin

Sure Set Precision Saw Gage, $27.45 postage paid from Quinn Tool Engineering Co., 4123 Mexico Road, Suite B, St. Peters, MO 63376. Call 314/926-8004.

Continued on page 86

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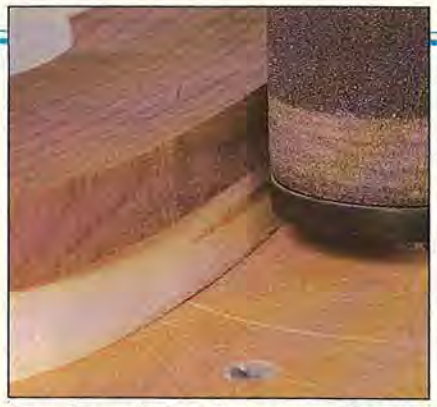
PRODUCTS THAT PERFORM

SHOP TESTED

Continued from page 85

Flush-sanding drum gives smooth results



Whenever I need several identical, curved workpieces, I first make a template of the shape. This way, I can bandsaw my stock to rough shape, attach the template, and rout the workpiece to the finished shape with a flush-trimming bit that works off the template's edge. This usually does the trick, but occasionally the router bit will tear out a chunk of grain, especially in highly figured stock.

Woodworker Ken Picou experienced the same problem, so he invented Robo-Sander, a sanding drum that works like a flush-trimming router bit. The product has a 3"-high, 3"-diameter sanding drum, ½" shank, and 3"-diameter template guide that functions like the pilot bearing on a flush-trimming bit. (You also can buy a light-duty version with a 1½"-high, 2"-diameter sanding drum and ¼" shank.)

I found that the Robo-Sanders cut much slower than a router bit, so I'll only use one when absolutely necessary. For figured pieces, such as quilted maple, I advise taking the time to bandsaw as close as possible to the layout line to save on sanding time. I'll still use my router bits for nonfigured stock, but I may employ the Robo-Sander on end-grain sections where I suspect grain-tearout problems. I'll also utilize the Robo-Sander for workpieces too thick for flush-trimming bits.

When using the Robo-Sander you must carefully choose your abrasives. A coarse abrasive (50-grit) will cut quickly, but will leave an edge that needs further smoothing (not a problem if you plan to rout a shape into the edge). Finer abrasives will cut slower, or possibly burn the surface, and won't cut to the same depth as coarser abrasives.

I recommend that you use the 3" version for most applications, and resort to the light-duty model only for stock thinner than ½".

—Tested by Chuck Hedlund

Robo-Sander, $32 (3" model) and $15 (2" unit). Add $3.50 per order for shipping. Ken Picou Design, 5508 Montview St., Austin, TX 78756. Call 512/454-3425.

Get a (good-looking) grip on your toy wheels

Just because you build toy cars and trucks out of wood, it doesn't mean you should shy away from good old rubber tires. At least, that's how I feel, especially after trying Rubbariders. These wooden wheels circled by synthetic-rubber tires offer convincing authentic looks. But besides this, I found that Rubbariders give your toys much better traction than wheels made entirely of wood, and they don't leave marks on hardwood or vinyl floors.

Rubbariders come in three diameters (1", 1¼", and 1½"). Each wheel comes with an axle.

—Tested by Chuck Hedlund

Rubbariders, $11.95 ppd. for a 12-pack (four of each size), from The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374. Call 612/428-4101.

Special fasteners offer several advantages

When I first saw the Double T Fastener, I asked myself "Does the world really need a new type of fastener?" After giving it a thorough tryout, I think this product deserves a place in the shops of many woodworkers.

The 1⅛"-long fastener has pointed ends and a shoulder area halfway between the ends. To join two pieces of stock, you hammer one end of a Double T Fastener into a workpiece using a special setting tool (the 5" hollow steel tube on the *right* side of the photo). Then, you align the mating workpiece and pound it into place with a rubber mallet. When working with hardwoods, I suggest you drill 1/16" pilot holes, and use the fasteners like dowel centers to mark hole placements on the mating surface.

In my tests, the fasteners held strongly, but I suggest that you apply glue to the joint if you want it to remain tight under stress. This unique product comes in handy anytime you want to avoid a nail hole, such as when attaching moldings. It also works great for joining end-to-end small moldings that won't accommodate splines or biscuits.

Tested by Chuck Hedlund

Double T Fasteners, $8.99 ppd. for 50 fasteners or 30 fasteners with a setting tool. Gifts of Creation, P.O. Box 875, St. Joseph, MI 49085-0875. Call 616/429-8818.

Continued on page 88

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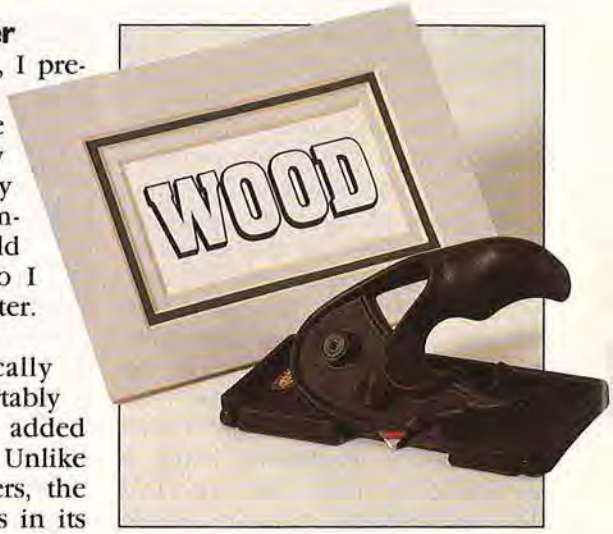
PRODUCTS THAT PERFORM

SHOP TESTED

Continued from page 87

A top-notch mat cutter



Like a lot of woodworkers, I prefer to make my own picture frames. And, I also like the satisfaction and money savings I gain by cutting my own mats. But, I wasn't completely satisfied with my old hand-held mat cutter, so I tried the Alto 45° Mat Cutter. I'm glad I did.

This sturdy, ergonomically designed model fits comfortably into my hand, giving me added control and less fatigue. Unlike other hand-held mat cutters, the Alto has adjustment screws in its base for fine-tuning the position of your cut. Another screw in the handle allows you to adjust the depth of cut (especially important for making decorative, V-shaped border grooves).

The design of the Alto gave me a clear view of the exposed blade, so I was able to quickly and easily line up my cuts. With my old mat cutter, the blade plunged through the middle of the base, making me guess where the blade would enter the mat.

The tool comes with five blades and a thorough sheet of instructions. Additional 5-packs of blades cost $1.50.

Tested by Bob McFarlin

Alto 45° Mat Cutter, item number 12J25, $29.95 plus shipping ($5.50 to $7.50 depending on size of order), from Woodcraft, 210 Wood County Industrial Park, Parkersburg, WV 26102-1686. Call 800/225-1153.

Inexpensive lettering guides make for affordable words

With my sights set on making a scrollsawn sign, I stopped by my local art store for some help. There I found reasonably priced, stencil lettering guides that helped me quickly and easily trace letters onto my workpiece.

Because of their clear-plastic construction, the C-Thru line of stencils make alignment of the letters a snap. They have smooth, die-cut edges and are thick enough to last a lifetime. You can buy the guides in 10 type styles, in upper- and lower-case letters from ¾" to 10" high, as well as numbers and punctuation. You also can buy stencils with a variety of graphic elements.

—Tested by Chuck Hedlund

C-Thru Stencil Lettering Guides, $3.75 to $29.95, depending on size of characters (most characters under 4" cost less than $6 per set). Contact the C-Thru Ruler Co., P.O. Box 356, Bloomfield, CT 06002. Call 203/243-0303.

Bet you can't top these new dado shims

With a quality dado-blade set, you can cut clean-as-a-whistle dadoes in any widths between ¼" and 13/16", as long as you shim the chipper blades. I used to slip scraps of paper onto my saw's arbor to accomplish this, and then I graduated to using durable, commercially made metal shims. Both of these methods take lots of time because you have to tediously remove your blades and chippers to replace the shims.

Nowadays, I use a set of plastic shims from Veritas that give me a real speed advantage. Because these flexible shims have a slot cut into them, I can leave the chippers in place when I switch shims. In no time at all, I change the width of my dado cut until I have it just right.

I checked my box of Veritas shims with a dial indicator and found all of them perfectly flat and precisely their stated thickness. The 14 color-coded shims come in their own plastic carrying case containing four shims in each of these thicknesses: .002", .010", and .020"; and two shims .005" thick.

—Tested by Bob McFarlin

Veritas Dado Shims, item 05J13.01, $6.95 plus $4 shipping for orders up to $25, or $5.50 shipping for orders $25–$50. Call 800/667-2986.

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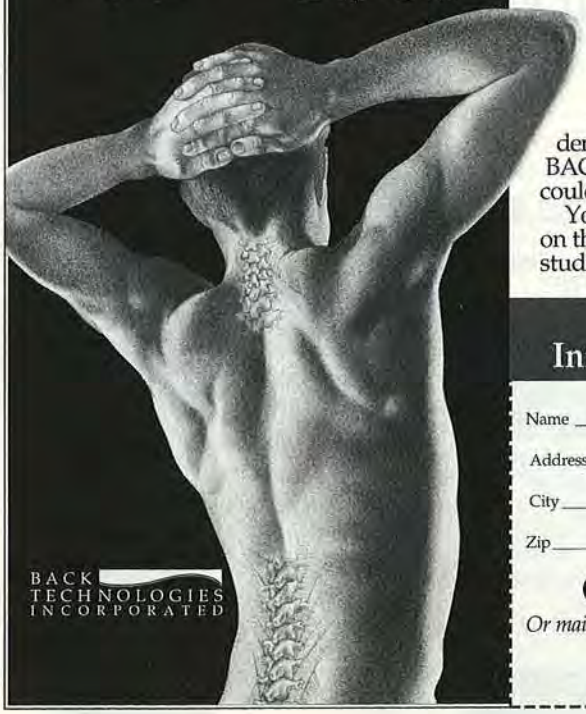

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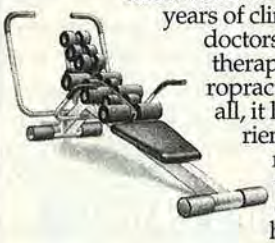

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BARRELMAKING'S TOP TOOLS

TWO PLANES THAT GAVE COOPERS A HEAD START

Collectors would expect to pay $35–$60 for a croze (left) or a howel (right). Complete tools in good condition, such as these, would sell at the top of the price range.

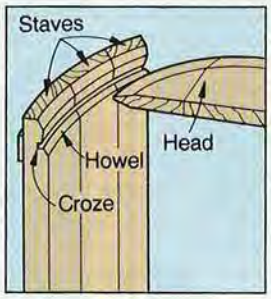
We don't see many wooden barrels these days. But back when the staved vessels with bulging sides were the principal containers for commerce, they were everywhere, and in an astonishing array of sizes.

Coopers, as barrelmakers were called, didn't produce just a few standard sizes. Instead, they constructed a variety of barrels to accommodate customary quantities of countless commodities. One reference lists 11 barrel sizes for gunpowder alone, eight for soap, and seven for beef—all different.

Whatever the barrel size, all coopers faced the same challenge: making round kegs from rectangular boards. That called for some tools unique to the trade. None were more specialized than a pair of planes called the howel and croze, shown *above*.

Closing a barrel

Installing the heads was one of the last steps in barrelmaking. The head's tapered edge fits into a narrow groove (the croze) cut into the middle of a shallow hollow (the howel), as shown *right*. Each cut and the tool to make it shared a name—a howel gouged out the howel; a croze, the croze.



After assembling the staves, the cooper trimmed the barrel ends and beveled them on the inside. Then, he grabbed a howel.

With the howel's fence riding on an end of the barrel, the cooper swung the curved, round-soled plane around the inside of the barrel. The uniform surface formed by the howel ensured that the croze, made next, would be the same depth all around, resulting in a tight-fitting head.

The croze had cutters like saw teeth (think of a dado set). Used the same way as the howel, it cut a narrow groove to receive the beveled edge of the barrel head.

Some howels and crozes were factory-made with iron bodies and fences, but most were shop-made of wood, often beech. Because the wooden fence became grooved with use, some coopers added metal to the face of the fence to reduce wear.

Howels and crozes faded from the trade as machine-made barrels became more common. And then with changes in product marketing and packaging, wooden barrels themselves disappeared, along with the trade.

Tools from the collection of Paul Gorham, Indianola, Iowa
Photograph: John Hetherington

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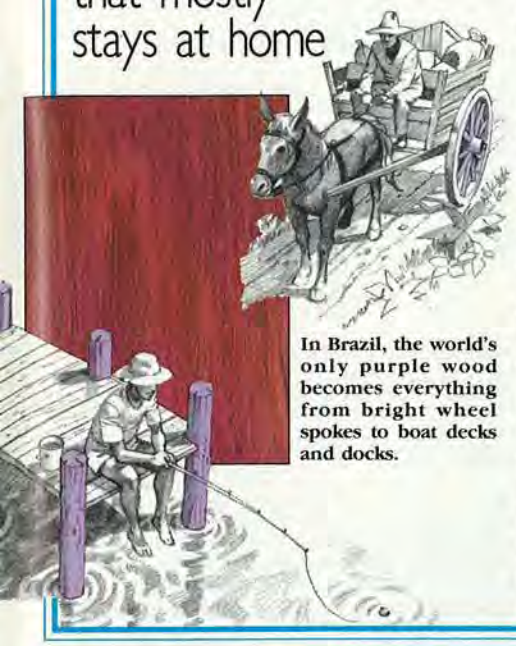
PURPLEHEART

The one-of-a-kind wood that mostly stays at home



In Brazil, the world's only purple wood becomes everything from bright wheel spokes to boat decks and docks.

There's a private mansion in Lenox, Massachusetts, with a library finished in wood. And the wood happens to be purpleheart (*Peltogyne paniculata*), that, true to its name and unique in the world, *is* purple.

According to wood historians, that 1930s' installation of purpleheart, or amaranth as it was called then, marked the first commercial use of the wood in the U. S. Today, you can still find commercial examples (although comparatively tiny ones) of purpleheart, such as in the butts of billiard cues. However, in northern Brazil where it grows, purpleheart ranks as just another common material.

Appearing brown when freshly sawn from a log, purpleheart heartwood soon takes on its distinctive hue. With continual exposure to the air, it turns a rich red-wine color, and outdoors will eventually weather to black. Yet, Brazilians couldn't care less about the color. To them, purpleheart has always been a working wood.

Because of its hardness and density, purpleheart turns easily and requires little sanding. It's also very strong and durable, so natives turn it into wheel spokes for their carts, tool handles, and parts for agricultural implements. But they also employ it as initially gaudy dock pilings, boat decks and planking, bridge timber, railroad ties, and even plywood.

You'll never see purpleheart in quantity outside of Brazil, though. That's because the wood weighs nearly 60 pounds a cubic foot. Sometimes it's so dense that logs won't float. That means that the timber must be hauled rather than rafted to the mills, and it proves to be quite a task moving logs greater than 3′ long.

Illustration: Jim Stevenson

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23-680	6" Bench Grinder 1/4 HP	86	75
23-880	8" Bench Grinder 1/2 HP	151	115
11-950	8" Drill Press	199	144
31-050	1" Belt sander 2.0 amp	104	78
31-460	4" Belt/Disc Sander	198	135
31-340	1" Belt/8" Disc Sander	268	198
31-080	1" Belt/5" Disc Sander	134	94
40-560	16" 2 speed Scroll Saw	266	178
11-990	12" Bench Drill Press	276	224
11-090	32" Radial Bench Drill Press	399	294
43-355	3/4" Shaper 1-1/2 HP	964	709
43-505	1/2" Bench Router/Shaper	399	279
22-540	12" Bench Top Planer	595	398
36-220	10" Compound Mitre Saw	350	239
28-180	Bench Band Saw	232	165
40-640	20" Bench Scroll Saw	466	318
37-070	NEW 6" v/spd Bench Jointer	330	255
14-600	Hollow Chisel Mortiser	668	448
46-700	12" Wood Lathe	548	436
34-761	10" Unisaw 1-1/2 HP	1715	1395
33-990	10" Radial Arm Saw	818	615
37-280	6" Motorized Jointer	488	395
50-179	3/4 HP 2 stage Dust Collector	483	335
70-200	20" Floor Drill Press	1049	810
33-055	8-1/4" Sawbuck comp w/legs	865	595
34-330	8-1/4" Table Saw 13A	343	234
32-100	Station Plate Jointer	645	258
36-040	8-1/4" Compound Mitre Saw	224	159
34-915	30" Unifence	385	239
34-897	50" Delta Unifence	525	285
36-755	10" Tilt Arbor Saw	1264	925
34-444	Contractors Table Saw	850	615
17-900	16-1/2" Floor Drill Press	495	395
40-601	18" Scroll Saw with stand	942	745
22-662	13" Planer complete - 2HP	1499	1168

Planer has $75.00 rebate-price is before rebate

33-060	NEW "Sidekick" Miter Saw	499	375
14-070	NEW 14" Floor Drill Press	450	345
50-075	Dust Collector/Sweeper 3/4 HP	360	245

The following Delta tools have a $50.00 rebate! Price shown is before rebate.

28-283	14" Band Saw w/enc. stand	910	735
34-445	34-444 Saw w/30" Unifence	1200	775
37-154	DJ15 6"Jointer w/3/4HP motor	1420	1095

MILWAUKEE TOOLS

6527	NEW Sawzall with case	309	172
6528	above Sawzall w/wired cord	305	172
6125	NEW 5"Random Orbit Sander	200	119
6126	NEW 6"Random Orbit Sander	205	125
0399-1	12V cordless Drill Kit comp	309	165
0402-1	above Drill w/keyless chuck	314	174
0395-1	9.6V cordless Drill with case	284	158
0224-1	3/8" Drill 4.5 amp magnum	215	116
0234-1	1/2" Drill 4.5A mag 0-850 rpm	229	119
0244-1	1/2" Drill 4.5A mag 0-600 rpm	229	123
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	189	107
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	186	104
0375-1	3/8" close quarter Drill	229	132
0379-1	1/2" close quarter Drill	260	145
6546-1	cdls Scrwdvr 200 & 400 rpm	138	82
5399	1/2" D-hdle Hammer Drill Kit	325	188
6750-1	Drywall Gun 0-4000 5 amp	168	95
6507	Original SawZall with case	259	144
6014	Orbital Sander 1/2 sheet	214	119
8977	variable temp. Heat Gun	128	77
5397-1	3.8" var. spd Hammer Drill Kit	250	142
5371-1	1/2" var. spd Hammer Drill Kit	375	185
3107-1	1/2" v/spd right angle Drill Kit	385	209
6754-1	Drywall Gun 0-4000 5.4 amp	192	108
3300-1	1/2" var. spd right angle Drill	339	189
5680	Router 2 HP - 12 amp	355	198
0235-1	1/2" Drill w/keyless chuck	229	129
6145	4-1/2" Grinder 10,000 rpm	165	99
6142	6145 with case & accessories	204	129
6749-1	Drywall Gun 0-2500 5.4 amp	224	122
6365	7-1/4" Circular Saw 13 amp	214	122
6366	6365 w/fence & carbide blade	224	127
6368	6365 w/fnce,carb. blde,& case	244	139
6377	7-1/4" Worm Drive Saw	324	178
6256	Top Handle Jig Saw	259	145
6490	10" Mitre Saw	444	269

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LU72M010	Gen Pur, A.T.B.	10" 40	69	39
LU82M010	Cut-off 10"	60	93	49
LU84M011	Comb 10"	50	78	42
LU85M010	Super Cut-off	10" 80	115	59
LM72M010	Ripping 10"	24	69	39
LU73M010	Cut off 10"	60	84	45
LU87M010	Thin Kerf 10"	24	72	39
LU88M010	Thin Kerf 10"	60	88	48
LU98M010	Ultimate 10"	80	128	68
LU91M010	Compnd Mitre 10"	60	88	54
TK303	7-1/4" Finishing	40	38	23
TK306	10" Finishing	40	47	28
TK906	10" Combo	50	53	30
SD306	6" Dado - Carbide		215	112
SD308	8" Dado - Carbide		230	119
F0	1-3/4" x 5/8" Biscuit 1000 Qty		43	29
F10	2-1/8" x 3/4" Biscuit 1000 Qty		43	29
F20	2-3/4" x 1" Biscuit 1000 Qty		45	29
FA	Assorted Biscuits 1000 Qty		45	29
FB100	16 piece Forstner Bit Set		338	184
94-100	5 pc. Router Bit Door System		320	163

The following FREUD Tools have a $30.00 rebate! Price shown is before rebate - Expires 10/31/93

FT2000E	3-1/4 HP v/spd Plunge Router	410	205
JS100	Biscuit Jointer with case	334	162

MAKITA TOOLS

Model	Description	List	Sale
6070DW	3/8" w/spd Reverse Drill 7.2V	128	74
6071DWK	above Drill w/removable batt.	203	110
5090DW	3-3/8" Saw Kit 9.6 volt	262	154
6010SDW	3/8" cordless Drill Kit 7.2V	99	59
ML900	Incandescent Flashlight 9.6V	Sale	37
6012HDW	2 speed Drill w/clutch-comp	243	129
6093DW	v/spd Drill w/clutch-complete	261	139
6093DWE	6093DW Drill Kit w/2 batteries	270	145
6095DW	6093DW Kit w/keyless chuck	278	135
6095DWE	6095DW Drill Kit w/2 batteries	270	148
6201DWE	NEW 9.6V Drill Kit w/2 batt.	298	155
6011DW	NEW 12V Drill Kit complete	330	165
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28
5007NBA	7-1/4" Saw w/electric brake	255	129
5008NBA	8-1/4" Saw w/electric brake	316	189
B04510	1/4 sheet Pad Sander	97	54
9900B	3" x 21" Belt Sander w/bag	297	169
9924DB	3" x 24" Belt Sander w/bag	313	159
4301BV	Orb. var. spd Jig Saw 3.5A	275	162
JR3000V	var. speed Recip Saw w/case	250	135
LS1020	10" Mitre Saw 3.5 amp	599	339
9820-2	Blade Sharpener	394	209
1900BW	3-3/4" Planer with case	232	129
1911B	4-3/8" Planer 7.5 amp	267	139
9514B	4" Disc Grinder 4.6 amp	104	65
3601B	1-3/8 HP Router	274	158
B04550	1/4 sheet Pad Sander w/bag	94	54
DA3000R	3/8" Angle Drill	299	155
2708W	8-1/4" Table Saw	544	289
2711	10" Table Saw with brake	911	558
6404	3/8" Drill Rev. 0-2100 rpm 2 A	108	59
6510LVR	3/8" Drill Rev. 0-1050 rpm	156	86
6820V	0-4000 rpm Drywall Gun 5.2 A	167	92
6013BR	1/2" Drill Rev. 6 amp	265	138
5402A	16" Circular Saw 12 amp	708	395
3612BR	3 HP Plunge Router	364	169
9401	4" x 24" Belt Sander w/bag	360	205
4302C	var. speed Orbital Jig Saw	297	189
5077B	7-1/4" Hypoid Saw	273	138
LS1030	NEW 10" Mitre Saw	428	209
5007NB	7-1/4" Circular Saw 13 amp	225	116
2012	12" Portable Planer	959	495
LS1011	10" Slide Compound Saw	870	498

SIOUX TOOLS

8030	New 3/8" var/spd Drill	238	139
8000	3/8" var/spd close qtr Drill	201	123
690	5" Air Random Orbit Sander	139	138
690VV	690 w/venturi dust collection	281	178
658	5" Air Rndm Sander-dual action	261	155

SENCO AIR NAILERS

SFN1	Finishing Nailer 1" - 2"	377	269
SFN2	Finish. Nailer 1-1/2" - 2-1/2"	571	378
SN325	Nailer 1-7/8" - 3-1/4"	665	425
SN4	General purpose 2" - 3-1/2"	685	468
SLP20	New Pinner w/case 5/8" - 1-5/8"	399	269
SKS	Stapler 5/8" - 1-1/2"	351	248
N70	NEW HD Framer 2" - 3-1/2"	625	479

BOSTITCH AIR NAILERS

N80S-1	Stick Nailer	Super Sale	348
N12B-1	Coil Roofing Nailer	845	405
N60FN-2	Finishing Nailer	625	335
T31	Brad Nailer	270	145
CWC100	1 HP Pancake Compressor	445	289

EXCALIBUR Fences & Tables

TT45R24L9	24" Fence	369	299
TT45R50L12	50" Fence	399	318
EXSLT30	Sliding Table	599	475
EXSLT60	Sliding Table	745	585

SKIL SIZZLERS

77	7-1/4" Worm Drive Saw	257	144
2735-04	12 volt cordless Drill Kit	249	132
2735-04X	2735-04 with keyless chuck	269	135
1605-02	NEW Biscuit Jointer w/case	221	129
3400	10" Table Saw - Bench Top	270	179
3330	16" Scroll Saw - Bench Top	205	135

PANASONIC CORDLESS

EY6205BC	NEW variable speed 12 volt Drill w/15 minute charger & case	390	179
EY6281BC	NEW variable speed 9.6 volt Drill w/15 minute charger & case	350	168
EY62821DKW	9.6 volt Drill Kit w/2 batt	275	155
EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 minute charger & case	421	222
EY6205EQK	Same as EY6205BC but battery has 40% more life & 20% more torque	368	169

PASLODE IMPULSE GUNS

IM250	Trimpulse Finish Nailer Kit	849	615
IM325	Impulse Framing Nailer Kit	849	595

HITACHI TOOLS

C7BD	7-1/4" Circular Saw with brake	235	124
M12V	NEW 3 HP var. speed Router	477	225
TR12	Plunge Router 3 HP	355	169
F1000A	12" Planer/6" Jointer	2835	1650
C10FA	10" Deluxe Mitre Saw	553	299
C12FA	NEW 12" Mitre Saw	632	315
C8FB	8-1/2" Slide Compound Saw	1026	599
FREUD LU91M008	8-1/2" Carb bld 48 t	68	43
C15FB	15" Mitre Saw	773	635
FREUD LU85M015	15"c/bld 108 tooth	180	99

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DS14
14" (350 mm)
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DS16
16" (400 mm)
List 5.10 Sale 4.15

DS18
18" (450 mm)
List 5.40 Sale 4.25

DS20
20" (500 mm)
List 5.60 Sale 4.35

DS22
22" (550 mm)
List 5.80 Sale 4.45

DELTA #34-080 10" MITRE BOX XTRA SPECIAL 198.00

DEWALT TOOLS

DW364	7-1/4" Circ. Saw w/brake 13 A	275	145
DW945K	3/8" 12V cdls Drill Kit w/2 batt.	296	169
DW944K	3/8" 9.6V cdls Drill Kit w/2 batt	277	154
DW610	1-1/2 HP 2 handle Router	270	148
DW411	1/4 sheet Palm Sander, 1.7 amp.	97	58
DW100	3/8" Drill, 4 amp,0-2500 rpm,rev	116	68
DW510K	1/2" v/spd Hammer Drill w/case	298	165
DW682K	Biscuit Joiner with case	428	225
DW705	12" Compound Mitre Saw	658	358
DW615	NEW 1-1/4 HP Elect. Plge Router	290	158
DW625	NEW 3 HP Electronic Plge Router	500	275
DW675K	NEW 3-1/8" Planer with case	280	159
DW431	NEW 3 x 21 v/spd Belt Sander	320	182

PORTA NAILER

401	Porta Nailer complete	265	198
501	Face Nailer complete	265	195

WERNER LADDERS

6204	4' Fiberglass	179	65
6205	5' Fiberglass	199	75

FALL KIT SPECIALS

9852K	Porter Cable 9852 Drill Kit w/extra batt	185	
9853K	Porter Cable 9853 Drill Kit w/extra batt	185	
7335K	Porter Cable 5" var. spd Random Orbit Sndr w/case & 1 roll 100X & 150X discs	273	169
7336K	Porter Cable 6" var. spd Random Orbit Sndr w/case & 1 roll 100X & 150X discs	278	175
555K	Porter Cable Plate Biscuit Jointer with case & 1000 assorted biscuits	339	195
JS100K	Freud Jointer w/cs & 1000 biscuits	351	188
1581VSK	Bosch Top Handle Jig Saw with case & 30 Bosch blades	305	195
1582VSK	Bosch CLIC Barrell Grip Jig Saw with case & 30 Bosch blades	305	195
JM100KK	Ryobi Joiner w/1000 biscuits	475	242

BIESEMEYER FENCES

B-50	50" Commer. Saw Fence	329	298
T-SQUARE 52	52" Homeshop Fence	249	238
T-SQUARE 40	40" Homeshop Fence	242	208
T-SQUARE 28	28" Homeshop Fence	230	198

WEDGE SMART LEVEL

SM-PR2	2 FT Level with sensor	120	88
SM-PR4	4 FT Level with sensor	150	105
SM-PR6	78" Level with sensor	180	139
SERIES200	NEW 2FT Level with sensor		55

Msx636 FEIN	Triangle Sander Kit	Sale	195
LPN672 PONY	Air Palm Nailer w/glove	Sale	94.99

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Open	List	Sale	Box of 6
#0	8"	4-1/2"	19.00	11.89	61.00
#1	10"	6"	21.76	12.89	70.65
#2	12"	8-1/2"	24.95	14.95	80.95
#3	14"	10"	31.61	18.95	104.95
#4	16"	12"	42.30	24.95	143.95

JORGENSEN STYLE 37 2-1/2" Throat 1/4"x3/4"

Item#	Jaw Length	List	Sale	Box of 6
3706	6"	9.86	6.25	34.75
3712	12"	10.92	6.75	37.75
3718	18"	12.05	7.25	40.75
3724	24"	13.16	8.19	43.75
3730	30"	14.70	9.10	49.75
3736	36"	16.05	10.19	55.75

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	13.61	7.89	84.99
52	1/2" Black Pipe Clamps	11.37	6.50	69.50

BOSCH

1581VS	Top Handle Jig Saw	265	145
1582VSC	NEW CLIC Barrell Jig Saw	265	145
	Bosch Metal Case for above Jig Saws	34	32
	Bosch 30 blade assortment for Jig Saws		27.99
1942	Heat Gun 600° - 900°	115	78
1272D	3" x 24" Belt Sander with bag.	340	186
1273D	4" x 24" Belt Sander with bag.	359	196
11-212VSR	Bulldog 3/4"SDS Rtry Drill	370	198
1347AK	4-1/2" Grinder w/case & access.	175	108
1348AE	5" Grinder 8.5 amp	209	118
1194VSR	1/2" var. speed Hammer Drill	254	145
1194VSRK	above Hammer Drill w/case.	292	179
1608	5.6 amp Laminate Trimmer	154	89
1609K	Lam Installers Kit with 1609	315	175
1609KX	Deluxe installers kit	369	209
1604	1-3/4 HP 2 Handle Router	249	137
1604K	same as above w/case & acc	299	169
1606	1-3/4 HP D-handle Router	273	172
3258	3-1/4" Planer w/blade guard	247	139
3258K	3258 Planer with steel case	273	154
3270D	3" x 21" Belt Sander with bag.	270	148
1273DVS	var. spd 4" x 24" Belt Sander	380	215
1614	NEW 1HP Plunge Router	225	128
1614EVS	NEW 1-1/4HP v/spd Plge Rtr.	260	149
1613	NEW 1-3/4 HP Plunge Router	290	164
1613EVS	NEW 2HP w/sp Plunge Router	330	184
1615	NEW 3 HP, Plunge Router	395	228
1615EVS	NEW 3 HP v/spd Plge Router	460	244
1632VSRK	Recip Saw 8.4A orb-v/spd	225	149
3050VSRK	9.6V cdls v/sp Drill Kit comp	256	138
3051VSRK	3050VSRK w/keyless chuck	266	145
1370DEVS	6" Random Orbit Sander	481	219
3283DVS	5" Random Orbit Sander	169	98
3283DVSK	3283DVS Kit complete	220	119

ELU BY BLACK & DECKER

Model	Description	List	Sale
3338	2-1/4 HP v/spd Plunge Router	448	255
3375	3-1/8" Univ. planer 7.2 amp	329	155
3380	Biscuit jointer with case	569	248
3339	NEW 3 HP v/sp Plunge Router	500	275

BLACK & DECKER

1166	3/8" Drill 0-2500 rpm 4 amp	105	65
1703-1	10" Mitre Saw w/73-770 blde	329	185
4011	1/4 sheet Palm Sander	86	59
79-034	Workmate 400	184	109
2694	7-1/4" Super Saw cat	260	144
2695	8-1/4" Super Saw cat	285	158

DAVID WHITE

LP6-20	Sight Level package - 20x	310	198
L6-20	Meridian Level - 20x	290	185
LT8-300	Level Transit - 26x	650	445
LT8-300P	above Level w/optical plum	769	519
LT6-900	Level Transit - 20x	389	245
ALT6-900	Automatic Level - Transit - 18x	549	385
ALTP6-900	above Level w/tripod & rod	600	438
ALP6-18HD	above Level w/tripod & rod	550	369

RYOBI SPECIALS

JP-155	6-1/8" Jointer/Planer	648	309
TS-254	10" Mitre Saw	420	209
RE600	3 HP Plunge Router	465	209
BE321	3" x 21" var. spd Belt Sander	290	138
TFD220VRK	12V cordless Drill Kit	325	172
JM100K	Biscuit Jointer w/case	453	215
BT3000	10" Table Saw	1204	545
TSS220	8-1/2" Slide Comp. Saw	966	445
DS1000	NEW Detail Sander	90	55
RS112	Palm grip Rndm Orb Sndr	90	59
AP12	NEW 12" Bench Planer	884	425
RA202	NEW 8-1/4" Bench Radial Saw	695	398
BS9000	NEW 9" Bench Band Saw	298	175
IDV26	NEW 28 Gal. Industrial Dry Vac	198	119
CSS450	NEW Oscilating Spindle Sander	298	175

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TOP 10	"Simply the Best"	699	559
STANDARD 10	"Professionals Choice"	499	399
COBRA	NEW Biscuit Joiner	Special	299

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	114
	Lots of 4 deduct additional 10%		

PORTER CABLE

690	1-1/2 HP Router 8 amp	255	138
9690	690 Router with steel case	305	149
691	1-1/2 HP Router D-handle	280	149
695	1-1/2 HP Router/Shaper	390	218
696	HD Shaper Table	225	129
351	3" x 21" Belt Sander w/o bag	270	148
352	3" x 21" Belt Sander with bag.	280	154
360	3" x 24" Belt Sander with bag.	350	194
361	3" x 24" Belt Sander w/o bag	330	184
362	4" x 24" Belt Sander with bag.	365	198
363	4" x 24" Belt Sander w/o bag	345	189
315-1	7-1/4" Top Hdle Circular Saw	220	118
9315-1	315-1 comp. w/cs & carb bld	250	139
617	7-1/4" Pushhandle Saw	220	124
9617	617 comp. w/case & carb blde	250	142
97751	1/2" v/spd Hammer Drill w/case	265	155
9629	Recip Saw var. speed 8 amp	265	148
9118	Porta Plane Kit 7 amp	380	209
505	1/2 sheet Pad Sander	225	118
6611	3/8" var. speed Drill 5.2 amp	210	118
6614	1/2" var. speed Drill 0-750 rpm	220	124
6615	7514 with keyless chuck	220	124
7549	Top handle Jig Saw 4.8 amp	260	145
330	Speed Block Sander 1/4 sheet	105	58
555	Plate Biscuit Jointer with case.	320	168
345	6" Saw Boss 9 amp	190	104
9345	345 comp. w/case & carb blde	220	119
9647	TIGER CUB Recip. Saw	205	117
9637	Full var/spd Recip Saw 8 amp	265	148
7519	3-1/4 HP Router 2 Handle	430	234
7518	3-1/4 HP 5 speed Router	495	272
7538	3-1/4 HP Plunge Router	430	234
7399	5.6 amp Drywall Cutout Unit	140	84
7310	5.6 amp Laminate Trimmer	160	92
97310	Laminate Trimmer Kit comp	355	197
7334	5" Random Orbit Sander	221	119
7335	5" var. spd Rndm Orbit Sndr	241	129
7336	6" var. spd Rndm Orbit Sndr	246	137
73333	NEW Dust Collection system	31.31	24.50
693	1-1/2 HP Plunge Router Base.	315	172
6931	Plunge Router Base	125	77
7539	3-1/4HP var/spd Plunge Router	495	268
9852	12V 3/8"Drill w/case 0-1000rpm	280	149
9853	9852 with keyless chuck	280	154
9854	12V 1/2" Drill w/case 0-360 rpm	290	159
8500	12V battery tor above drills	Sale	39
	New Tools by Porter Cable		
9841	9.6 volt cordless Drill Kit with 15 minute charger, battery, & case	309	174
9840	9.6 volt cordless Drill Kit with 1 hour charger, 2 batteries, & case	289	164
332	Palm Grip Rndm Orbit Sander	116	64
333	above Sander with dust bag	131	68
352VS	3x21 Belt Sander w/bag v/spd	295	165
7116	24" Omni Jig	530	294
334	333 Sander with PSA pad	131	74
550	Pocket cutter with case	330	185
7700	10" "Lazerloc" Miter Saw	634	339

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FINISHING TOUCHES

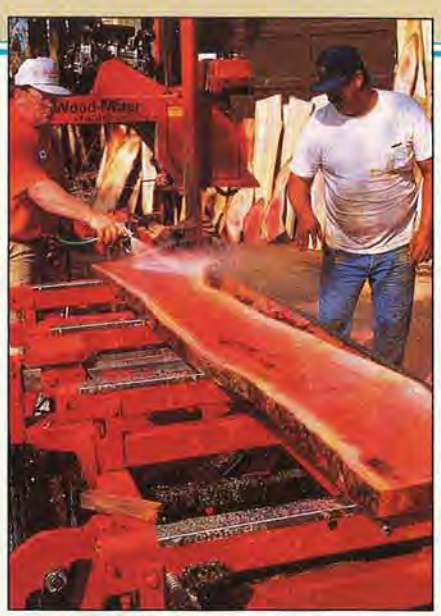
Print this article

SPECIES FOREVER PRESERVED

Hurricane Andrew played no favorites during its rampage. Native trees, cultured landscape trees, and fruit groves alike were equally felled. And among the casualties were more than 20 species of rare, tropical trees on the 84 acres of the Fairchild Tropical Garden near Miami. But unlike most other trees downed by the storm, Fairchild's will live on, in a way.

Thanks to Wood-Mizer, an Indianapolis, Indiana, manufacturer of portable sawmills, logs from Fairchild's unique trees were turned into boards. The boards—needing seasoning—were sold at auction to raise funds toward restoration of the gardens.

According to Nathan Collins, of Wood-Mizer South in Newnan, Georgia, who spent two and one-half days helping mill the wood, there were some pretty special species available. About 700 board feet of Indian elm, for instance. And 250 board feet of lacewood. Then there was yellowwood, logwood, paradise tree, and tamarind, to a name a few.



Volunteers from Wood-Mizer help to turn a blowdown of rare trees into over 3,000 board feet of even rarer lumber.

IS THIS REAL WOOD?

HARDWOOD®

Believe it or not, woodworkers, some folks just can't tell the difference between fake wood and the real thing when they shop around in a furniture store. But the Hardwood Institute, based in Memphis, plans to help straighten out the confusion.

Following the lead (quite a few years' lead) of the cotton and wool industries, the Hardwood Institute has developed a distinguishing label for products made of genuine hardwood. The new mark is being made available to manufacturers and retailers to place on their products. "It's just that we think people have the right to know what it is they're buying," explains Walter Fields, Hardwood Institute chairman. "We think that if it's made out of real hardwood—walnut, oak, or maple and such—the buyer ought to at least know that it is genuine, versus a printed piece of paper or plastic." Right on!

ANSWERING THE CALL

At this time last year, National Guardsmen, relief agencies, and citizen volunteers were answering the call for help from those devastated by Hurricane Andrew in southern Florida and Louisiana. But businesses also responded.

For instance, the DeWalt Industrial Tool Company of Hampstead, Maryland, sent $50,000 worth of corded and cordless power tools to the inflicted areas. They also furnished roving vans that provided tool drop-offs and repairs.

Building materials arrived, too. Truck convoys from the Pacific Northwest brought donations from labor, timber companies, and grassroots groups. Members of the Northeast Lumber Manufacturers Assoc. sent over $200,000 worth of pine sheathing materials. Weyerhaeuser, Boise Cascade, and Champion gave over 30 semi-trailer loads of plywood and lumber. The Louisiana forest products industry made hundreds of tons of material available in their state. National Forest Products Assoc. president Barry Cullen called the effort "one of the most intensive emergency supply efforts ever."

Illustrations: Jim Stevenson
Photograph: Courtesy of Wood-Mizer, Inc.

THE WORLD'S GREENEST NATION

In Finland, a country half the size of Texas, pine and spruce forests cover two thirds of the land, more than in any other nation. About 10 percent of the forested lands are protected as parks. The remainder is managed for sustained yield, and the forests' annual growth exceeds annual harvest by 30 percent. For comparison, forests cover about one third of the United States, and about 20 percent of that is permanently protected. In 1990, annual growth of U.S. forests exceeded harvest by 37 percent (and has been over 25 percent for the last 40 years).

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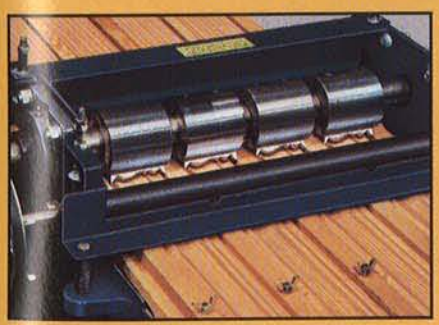

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Editor, Workbench Magazine

Best Value–"After checking them all, Woodmaster was obviously the best deal for the money. Also, I would like to acknowledge the polite and prompt service."

E. D. Holtz, North Carolina

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